Manufacturing Technology Training
An IMTMA initiative

Servicing, Maintenance and Trouble shooting of CNC Machine Tools – Mechanical, Electrical and Electronics Aspects (2 Modules)
Date : 18 to 23 April, 2022
Venue : IMTMA Technology Centre, Pune

INTRODUCTION

CNC machines are real Mechatronic systems, having electrical and electronic circuits interacting with mechanical actuators / sub systems. Diagnostics and root cause analysis are important aspects of maintenance, which are most often ignored. Often the roots of a mechanical problem could be in the electronics area and that of an electronic problem could be lying elsewhere in the machine. A thorough understanding of the various sub systems & CNC machine circuit diagram is needed to find and fix the root cause to minimize MTTR (Mean Time To Repair) and effective planning of PMBF (Preventive Maintenance Before Failure) towards zero down time.

Keeping this in view, Indian Machine Tool Manufacturers' Association (IMTMA) is organizing **6 days workshop on "Servicing, Maintenance and Trouble shooting of CNC Machine Tools – Mechanical, Electrical and Electronics Aspects" at Pune**. The training will be based on a hybrid approach with group exercises on circuit diagram study and practical demonstrations in CNC machines and sub systems maintenance and trouble shooting.

*Participants may register for individual modules as well.

Module 1 - Electrical and Electronics Aspects | **Date:** 18-20 April 2022.

Module 2 - Mechanical Aspects | **Date:** 21-23 April 2022.

FOCUS AREAS

Module -1 (Electrical & Electronics Aspects)

- **Anatomy of CNC machines** –
  - Overview of various sub-systems of CNC Turning and Machining Centres.
- **Systematic approach to diagnostics and problem solving**.
  - Circuit Diagram study – Electrical and electronic circuits
  - Circuit Diagram study – Hydraulic, Lubrication and Pneumatic sub systems
  - Maintenance aspects in CNC controllers
  - Typical problems in Electrical and Electronic sub-systems; Safety aspects; Alarm messages, Alarm History and Operations History
  - Maintenance aspects of drives and encoder
  - Demo and Group exercises in electrical circuit diagram study
  - Demo of Do's and Don'ts in CNC controllers

Module - 2 (Mechanical Aspects)

- **Ball Screw & LM guides**
  - Types and applications of Linear Motion guideways
  - Types and applications of Ball screw
- **Spindle**
  - Bearing types & their application in Machine Tools
  - Spindle failure & reconditioning
  - Spindle bearing preloading
  - Preventive maintenance of spindles
- **Machine Tool Accuracy**
- **Live Demo on:**
  - Laser Calibration
  - Ball bar testing
  - Live demo of Spindle dismantling and assembly
  - Group Discussion on Maintenance problem

KEY TAKE AWAYS

After undergoing the programme, the participants will be able to learn

- How to carry out preventive and break-down maintenance of CNC machines
- Identifying faults in various components of CNC machines
- How to report faults correctly to the manufacturer
- Sub systems and circuits of CNC machines
- Assembly process of Spindle and other critical components
- Trouble shooting of mechanical and electronics typical issues
- Accuracy measurements
- Axis calibration methods
- Trouble shooting of hydraulics and pneumatics

PARTICIPATION FEE

Rs. 17500/-
+18% GST
IMTMA Members/ Micro Companies/ Individuals/ Educational Institutions / Students/ IMTMA Non Members/ Others

USD 700/-
Overseas Participants

Group Concession : 10% for 3 to 5 and 20% for 6 and more delegates being nominated from the same company

PARTICIPANT PROFILE

Minimum one year experience from the various functions mentioned below:

- Service engineers
- Maintenance engineers
- Production engineers
- Quality engineers
- Project engineers
- Assembly engineers
- Testing engineers
- Application engineers

FACULTY

This programme will be conducted by **Mr. Ramadas R Nambi**, **Mr. Avinash Khare, Mr. S K Gupta, Mr. Ashok Raj, Mr. Gautam Doshi & Industry Experts from Setco Spindles & Renishaw.**

Mr. Ramadas R Nambi is an industry expert with over 30 years of experience in the area of CNC control systems, CNC machines, Industrial robots & Unmanned operations. Presentations will be accompanied by practical demonstrations and case studies. The workshop will be highly interactive where participants will be able to discuss specific problems in maintenance and solicit feedback from the expert faculty.

Mr. Avinash Khare is presently working as a Consultant Head for IMTMA Pune Technology Centre for the last 5 years; he has been designing, developing content and delivering a wide range of Training Courses as a Faculty. He is Electrical Engineer by Qualification and he has worked for over 33 years at Tata Motors Pune in various capacities ranging from R&D in Industrial Electronics, Machine Maintenance, Technology Procurement, Head of Machine Shops, Tool Room Shop Head, Head of Die Design and Champion in Business Excellence. He has taught Instrumentation and Bio Medical Instrumentation at Pune University as part-time faculty.

Mr. SK Gupta has worked as an Assistant General Manager, Machine Design & Business Development, Tata Motors - Machine Tools division, Pune. He has over 3 decades of professional experience in the field of Machine Tools and Fixturing practices.

Mr. Ashok Raj is an engineering professional and now a trainer with over 42 years of industry experience in the areas of design, manufacturing & service. He has been trained in hydraulics by Vickers Sperry and was responsible for both design and maintenance/service of hydraulic systems, pneumatic systems and other fluidic systems in his various work assignments which cover both the machine building & automotive sector.

Mr. Gautam Doshi is a B.Tech. (Mech) from IIT, Powai and an industry expert with over 35 years of experience in the Machine Tool and Automotive industry. He has conducted several training programmes, seminars & workshops on machine tool related subjects. He is a consultant to reputed companies in the area of Productivity and Quality improvement and Adviser to many companies manufacturing automotive components and Dies & Moulds. Mr. Doshi is former Vice President & Technical Director, PMT Machine Tool Automatics Ltd., Pune and has also served in Tata Motors for over 5 years. He is the author of several IMTMA publications such as 'First Time CNC', Guidelines on Process Capability to name a few.

For Registration Contact
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REGISTRATION : Prior registration for participation is necessary. Number of participants is limited and will be accepted on 'First Come First Serve' basis. A Certificate of participation will be issued to participants.
Important Information : Participation fee includes, course material, working lunch and tea / coffee. Interested companies are requested to register online by clicking on 'REGISTER' button and by filling up the nomination authority and participant's details in specified form.