



PENYELENGGARAAN BERASAS MASA DAN KEADAAN

1 November 19-20, 2025 (Wednesday-Thursday)

8.45 am – 5.00 pm **FMM Institute, Perak**



This course provides participants with the knowledge and practical skills needed to implement Time-Based Maintenance (TBM) and Condition-Based Maintenance (CBM) strategies effectively. It explores the differences between scheduled maintenance and predictive, condition-driven approaches, highlighting how both can be applied to optimize asset performance, reduce unexpected failures, and improve cost-efficiency. Participants will learn to identify critical equipment, determine maintenance intervals, apply monitoring techniques, and integrate CBM technologies such as sensors and IoT into their maintenance programs.

.... COURSE CONTENTS....

MODUL 1: PENGENALAN

- Konsep Asas Penyelenggaraan Berjadual vs. Tidak Berjadual
- Evolusi Penyelenggaraan (Reactive → Preventive → Predictive → Proactive)

MODUL 2: PENYELENGGARAAN BERASAS MASA (TBM)

- Definisi Dan Prinsip Asas
- Kelebihan & Limitasi TBM
- Penetapan Jadual Berdasarkan Jam Operasi, Tarikh Kalendar, Atau Bilangan Kitaran
- Contoh Aplikasi Industri

MODUL 3: PENYELENGGARAAN BERASAS KEADAAN (CBM)

- Definisi Dan Prinsip Asas
- Parameter Pemantauan (Getaran, Suhu, Tekanan, Arus Elektrik, Minyak Pelincir)

- Alatan Dan Teknologi CBM (Sensor, Iot, Predictive Analytics)
- Contoh Aplikasi Industri

MODUL 4: TBM VS CBM – PEMILIHAN STRATEGI

- Analisis Kos Faedah
- Analisis Risiko Dan Criticality Assets
- Strategi Hybrid (Gabungan TBM & CBM)

MODUL 5: PELAKSANAAN CBM

- Proses Data Acquisition Dan Monitoring
- Condition Monitoring Techniques (Vibration Analysis, Thermography, Oil Analysis, Ultrasonic Testing)
- Integrasi Dengan CMMS & Dashboard Digital

MODUL 6: ANALISIS DATA & KEPUTUSAN PENYELENGGARAAN

- Bagaimana Data Ditukar Kepada Tindakan
- Root Cause Analysis (RCA) Dalam CBM
- Menentukan “Maintenance Trigger Points”

MODUL 7: KPI & KEBERKESANAN PROGRAM

- MTBF, MTTR, OEE
- PM/CBM Compliance Rate
- Kos Penyelenggaraan Per Unit Output

MODUL 8: KAJIAN KES & LATIHAN PRAKTIKAL

- Kajian Kes Industri (Contoh Kilang Pembuatan)
- Latihan Merangka Jadual TBM & CBM Untuk Aset Tertentu
- Perbincangan Kumpulan & Pembentangan

...OBJECTIVES...

By the end of this course, participants will be able to:

- **Understand the principles** of Time-Based and Condition-Based Maintenance.
- **Differentiate between TBM and CBM**, and identify when each approach is most suitable.
- **Apply TBM strategies** to schedule routine inspections, servicing, and part replacements.
- **Implement CBM techniques** using monitoring tools (vibration, temperature, oil analysis, etc.) to predict failures.
- **Evaluate asset criticality** to determine appropriate maintenance strategies.
- **Develop TBM and CBM schedules** that balance reliability, safety, and cost.
- **Leverage digital technologies** (sensors, IoT, CMMS) for real-time condition monitoring.
- **Improve maintenance decision-making** by analyzing equipment health data.
- **Reduce downtime and costs** through optimized maintenance planning.
- **Support reliability-centered maintenance (RCM)** programs by integrating TBM and CBM practices.

.... WHO SHOULD ATTEND....

- Maintenance - Managers, Engineers, Supervisors, Technicians
- Operations - Managers, Engineers, Supervisors & Line functions Personnel

.... METHODOLOGY....

Lectures, case studies, practical hands-on exercise, question and answer

.... TRAINER....

MR RAJANDRAN A/L KRISHNASAMY holds a Diploma in Mechanical Engineering from Federal Institute of Engineering, KL and a Certificate in Electronics from Seremban Electronics. He started his career with Motorola Semiconductor in the area of Equipment Maintenance Function and grew steadily to become an Equipment Engineer. He later joined QDOS Microcircuits as a Production Section Head and subsequently joined a Japanese MNC as a Training Department Section Head and then as Engineering Section Head and Safety Officer hitherto.

MR RAJANDRAN is a certified trainer registered with PSMB and has conducted numerous programmes such as Total Productive Maintenance, Basic Mechanical Maintenance, Occupational Safety & Health Management System and Supervisory Management. In the past, he has conducted training courses for Samsung, Northern Telecom, Globetronics Technology, ISO Technology and SMCI Globetronics Technology. In addition, he has also won the Gold Medal as a Total Productive Maintenance Coordinator for Equipment in the Final Test Department in a Total Customer Satisfaction Competition held in Chicago, USA.

.... COURSE DETAILS....

Date **November 19-20, 2025 (Wednesday-Thursday)**

Time **8.45am - 5.00pm**

Venue **FMM Institute Perak**
No 1, Lorong Raja DiHilir, 30350 Ipoh, Perak

Medium of Instruction **B.Malaysia**

CPD **14 hours**

Fees ☐ **Members RM1,134.00/pax**

☐ **Non-Members RM1,296.00/pax**

(Fees inclusive of Service Tax at 8%, Course Materials, Refreshment, Lunch and Certificate of Attendance)

.... ADMINISTRATIVE DETAILS....

HRD CORP CLAIMABLE COURSE DETAILS

- Training Provider: **FMM Institute Perak ■ MyCoID : 475427W_PERAK**
- HRD Corp Programme No: **Provided upon confirmation**

DISCLAIMER

The FMM Institute reserves the right to change the facilitator, date and to vary / cancel the course should unavoidable circumstances arise. All efforts will be taken to inform participants of the changes.

REGISTRATION

- Upon **Faxing/Mailing** the completed **Registration Form** to FMM Institute, you are **deemed** to have read and **accepted** the terms and conditions. The **course** would also be **deemed** as **confirmed** unless informed otherwise.
- Will be based on **First-Come-First served** basis.

PAYMENT

- Cheques** made in favour of **"FMM Institute"** should be forwarded to FMM Institute Perak.
- For **HRD Corp Claimable Course**, an **Attendance of 100%** is a **must**, in any case, **employers will be billed in full**.
- FMM Institute SST Registration No. **W10-1901-32000105**
- FMM Institute TIN No. **C10626805080**

CANCELLATION

Must be in Writing with Reasons ■ 7 days before the course – No payment charged ■ 3 – 6 days before the course - 50% payment charged ■ < 3 days before the course – Full payment charged ■ Participants who did not turn-up will be charged full payment ■ Replacements can be accepted at no additional cost

Closing Date: NOVEMBER 12, 2025

~ Registration Form ~

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FMM Institute

No 1, Lorong Raja DiHilir, 30350 Ipoh, Perak

Fax: 05-5488221

Dear Sir / Madam, please register the following participant(s) for the above programme.

1.	Name		Designation	
			HP No	
	NRIC		Email	
2.	Name		Designation	
			HP No	
	NRIC		Email	
3.	Name		Designation	
			HP No	
	NRIC		Email	

(Please attach a separate list if space is insufficient)

We hereby confirmed that *(Please tick (✓) in appropriate box):-*

- ☐ We **will be claiming from HRD Corp** and full payment would made to FMM Institute in the event that no disbursement from HRD Corp under any circumstances
- ☐ We will **NOT BE CLAIMING from HRD Corp**. Enclosed cheque/bank draft No _____ for RM _____ being payment for _____ participant(s) made in favour of the **"FMM Institute"**.

Submitted by:

Name:	Designation:		
Company:	Tel:	Fax:	
Address:			
Email:	FMM Membership No		

Enquiries – please contact **Ms Vaani / Pn Eda / Ms Harvindar ☎ (05) 548 8660 📠 (05) 548 8221 ✉ fmm_institute_perak@fmm.org.my**