

# 3-Day Certified Reliability Centered Maintenance (RCM) Workshop

Advancing to the next level of maintenance with a comprehensive technical integration of RBM and the latest software to boost your organisation's profit margin

Dubai, UAE

22<sup>nd</sup> – 24<sup>th</sup> July 2019

This 3-Days Training Course will be Certified by the International RCM Certification Committee (IRCC) once delegates achieve >80% on the online examination which will be facilitated on the 3rd day of the workshop

Participants are required to bring their laptops on Day-3 for:

- Case Study using DORA Software
- Online Examination

Your Expert Course Trainer:

**Rik Plattel** Director

**European Reliability Centre, Netherlands**

Founder & Chairman

**International RCM Certification Committee (IRCC)**

Rik Plattel started as a ships engineer. He joined SKF as a rolling bearing expert for many years and was responsible for the service department, training department and after market troubleshooting. Then he became maintenance manager and later as operations manager in a large production plant of Superfos Packaging. He studied Reliability-centred Maintenance up to RCM Level 4 (RCM examiner). Currently, Rik is the director of the European Reliability Centre and founder and chairman of IRCC (International RCM Certification Committee)

Testimonials:

This training gave us an insight into maintenance planning in detail.

**Saudi Aramco, KSA**

Arrangements in terms of facility and material was excellent.

**Sohar Aluminium, Oman**

The training helped us to schedule and plan more effectively.

**Saudi Electricity Company, KSA**

Everything, it was excellent.

**Saudi Chevron, KSA**

Science can amuse and fascinate us all, but it is **engineering** that changes the world.

Isaac Asimov

The probability of success is dependent on the accurate calculation of reliability

**marcusevans**

Attend this Premier Training and Gain Insights Into:

- **Utilising** new RCM techniques within your plants to optimise maintenance
- **Differentiating** RCM as the proven method compared to other maintenance techniques
- **Incorporating** best maintenance strategies for optimum reliability results in your operations
- **Integrating** the right Key Performance Indicators (KPIs) to evaluate and improve performance in maintenance
- **Implementing** RCM successfully with a comprehensive knowledge on the maintenance strategy

**marcus evans** Training Courses are Thoroughly Researched and Structured to Provide Intense and Intimate Practical Training to your Organisation. Our Format:

- Strictly limited seats
- Pre-course questionnaires
- An in-depth tailored programme to address current concerns
- Diverse real life case examples
- Comprehensive course documentation

Pre- course questionnaire

To ensure that you gain maximum benefit from this training, a detailed questionnaire will be sent to you to establish exactly where your training needs lie. The completed forms will be analysed by the course trainer. As a result, we ensure the course is delivered at an appropriate level and that relevant issues will be addressed. The comprehensive course material will enable you to digest the subject matter in your own time.

Day One

**Monday 22<sup>nd</sup> July 2019**

**Session One**

**Introduction to Reliability Management techniques**

- Development of maintenance methodologies in time
- Past - Present - Future of Reliability Management
- Influence of Internet, Internet of Things and Big Data
- Using existing FME(C)A's
- Analysing CMMS data
- The need of managing ACTUAL failure behaviour
- Introduction of Reliability-centred Maintenance (RCM)

**Case Study:** Discussion of used pros and cons of known approaches

**Session Two**

**The RCM methodology**

- Breaking down International RCM standards SAE JA1011 and JA1012
- Comprehending the RCM terminology
- Overview of all RCM dialects/RCM brands that apply to the RCM standards
- Any RCM process shall ensure that all of the following steps are performed in the sequence shown:
  - Determine the operational context, functions and associated desired standards of performance of the asset (operational context and functions)
  - Determine how an asset can fail to fulfil its functions (functional failures)
  - Determine the causes of each functional failure (failure modes)
  - Determine what happens when each failure occurs (failure effects)
  - Classify the consequences of failure (failure consequences)
  - Determine what should be performed to predict or prevent each failure (tasks and task intervals)
  - Determine if other failure management strategies may be more effective (one-time changes)

**Group Discussion:** What is the advantage of this team based approach?

**Session Three**

**Zooming into Criticality and Failures**

- Criticality assessments using Risk Priority Numbering
- Differences between Object and Process FMEA/FMECA
- Determining when to use which process
- Deep-diving into Failures:
  - Failure Modes
  - Failure Patterns
  - Potential Failures
  - Functional Failures
  - Hidden Failures
  - Failure Consequences
  - Failure Management Policy

**Case Study:** Using Failure Modes to Determine the Quality of both FMEA and FMECA

**Session Four**

**Selecting and Setting Up the Analysis**

- Finding high-medium-low critical systems in order to select the right methodology
- Setting up an asset tree and a process tree
- Preparing data from CMMS's
- Setting up an Operational Context
- Describing related functions

**Group Discussion:** Maintaining Assets or Failure Behaviour of Assets

**Programme Schedule:**

0830	Registration and morning coffee
0900	Workshop commence
1030	Morning refreshment and networking break
1045	Workshop re-commence
1215	Networking luncheon
1330	Workshop commence
1500	Afternoon refreshment
1515	Workshop re-commences
1645	Workshop concludes

Day Two

**Tuesday 23<sup>rd</sup> July 2019**

**Session One**

**Scrutinising the Categories of Failure Behaviour**

- Describing Functional Failures
  - Functional Failure types
  - The importance of the Functional Failure

**Case Study:** Characterising Functional Failures of Assets

**Session Two**

**Comprehensive Analysis on Failure Behaviour**

- Interpreting Failure Modes
  - Using the RCM checklist
  - Case Study: Discussing failures and failure modes
- Process FMEA vs. Object FMEA
- FMEA vs. FMECA
- Use of the checklist to select a FMEA/FMECA

**Case Study:** Selection process for Object/Process FME(C)A

**Session Three**

**Distinguishing the Effects of Failure Behaviour**

- Diagnosing failure effects
- Classifying different types of failure effects
- Finishing a RCM Process FMEA

**Case Study:** Examining Failure Effects within an Organisation

**Session Four**

**The Maintenance Concept**

- Outlining the RCM Decision Diagram
- Selecting a failure consequence category
- Selecting the maintenance task type:
  - On-condition tasks
  - Discard tasks
  - Restoration tasks
  - Combination of tasks
  - Failure finding tasks
  - Redesign Mandatory/Desirable
  - Corrective tasks

**Case Study:** Developing the Maintenance Concept

**Case Study:** Nesting the Maintenance Concept > Maintenance Plan

**Business Development Opportunities:**

Does your company have services, solutions or technologies that the conference delegates would benefit from knowing about?

If so, you can find out more about the exhibiting, networking and branding opportunities available by contacting:

**Nadeem Hasnaat** on **+603 2603 2693**  
or email: **NadeemH@marcusevanskl.com**

**marcus evans** would like to thank everyone who has helped with the research and organisation of this event, particularly the course leader, who has kindly committed and supported the event.

## Wednesday 24<sup>th</sup> July 2019

### Session One

#### Maintenance and Project Engineering (MPE)

- Using MPE to measure the effectiveness of an analysis
- Introduction of the Quick Maintenance Methodology
- The QM decision process
- Demonstration of QM in DORA software

**Group Activity:** Calculating the MPE

**Case Study:** Using DORA Software to Set Up a QM

### Session Two

#### Maintenance Task Interval

- Calculating the Maintenance Task Interval
- Dissecting the different types of tasks involved:
  - On-condition tasks
  - Discard tasks
  - Restoration tasks
  - Combination of tasks
  - Failure finding tasks

**Case Study:** Calculating Tasks Interval for All Task Types

### Session Three

#### Integrating QM Analysis within your Maintenance Plans

- Nesting maintenance concepts into maintenance plans
- Continuous improvement and optimisation of your maintenance plans
- QM case study in DORA software

**Group Activity:** Demonstration of a RCM and QM analysis in DORA software. Participants have Level 1 access to DORA

### Session Four

#### Wrap-Up Session

- Recap of training objectives and sessions

#### IRCC Level 1 RCM Online Examination

This 1-hour examination will cover all the elements and fundamentals learned over the course of this 3-day training. Participants would need to achieve a score of >80% in order to receive the RCM Level 1 Certificate by the IRCC.

#### Who Should Attend:

##### General Managers, Managers, Supervisor, Heads, Team Leaders of:

- Plant Operations
- Plant and Site Management
- Asset and Reliability Management
- Shutdown / Turnaround
- Planning / Scheduling
- Asset Management
- Engineering and Maintenance
- Production and Manufacturing
- Process Engineering/ Industrial Engineering/Reliability Engineering
- Operational Excellence/ Continuous Improvement
- Plant Services/ Critical Support Systems Management
- Plant and Refinery
- Factory
- Technical Services
- Integrity

##### From the following industries:

- Oil and Gas
- Chemicals and Petrochemicals
- Power and Utilities
- Heavy Industries
- Engineering firms
- Industrial Gasses
- Automotive
- Steel
- Cement

#### About the Facilitator:

**Rik Plattel** started as a ships engineer. He joined SKF as a rolling bearing expert for many years and was responsible for the service department, training department and after market troubleshooting. Then he became maintenance manager and later as operations manager in a large production plant of Superfos Packaging. This led to increasing interest in Reliability Management. He studied Reliability-centred Maintenance up to RCM Level 4 (RCM examiner). Rik is director of the European Reliability Centre and founder and chairman of IRCC (International RCM Certification Committee).

#### Clients:

His clients are found in many industrial sectors around the world: Food, Packaging, Shipping, Plastics, Waste, Water, Power, Nuclear, Mining, Pharmaceutical, Chemical, Oil & Gas. Rik focuses most of his time teaching and mentoring clients with RCM implementations. Most customers are large production plants.

#### Software:

From 2001 onwards, the European Reliability Centre (ERC) B.V. developed DORA software, together with 16 Best-In-Class industrial production sites from different industrial sectors. DORA facilitates RCM workgroups, the development of new maintenance plans and optimising existing maintenance plans. The maintenance plans which are developed in DORA will update the maintenance programs in SAP, Maximo, JD Edwards, Infor or other CMMSs. DORA offers three methodologies for high – medium – low criticality processes / systems / assets.

DORA supports three methodologies:

- RCM for high critical systems.
- ODM (Object Driven Maintenance) for medium critical systems.
- QM (Quick Maintenance) for low critical systems.

These three methodologies use RCM definitions. RCM is a team based approach with the highest quality. It is thorough and needs time to get the high quality. QM is 15x faster, less thorough and can be executed by single persons. ODM is a mix of RCM and QM. DORA supports nesting Maintenance Concepts into Maintenance Plans. In order to prevent Garbage in as Garbage out, DORA users need to understand the used methodologies. This Certified RCM Level 1 Training Course covers the basics. Participants are able to work in DORA during the training course.

#### Why You Cannot Miss This Event:

Reliability-centred Maintenance is a process to determine what must be done to assure systems continue to do what their owner wants them to do in their present operating context. RCM is a team driven methodology which is managed by a RCM facilitator. This approach was initially developed in the civil aviation and is used by all industrial segments that need to manage failure behaviour in order to optimise **C.A.R.E. (Cost – Availability – Reliability – Effectiveness)**. The team describes the actual failure behaviour in a FMEA process which is used in a RCM decision diagram to develop the maintenance concept. This maintenance concept is nestled into a maintenance plan which updates the CMMS regularly. But maintenance plans are never finished. Failure behaviour changes in time and so does the FMEA. The continuous improvement of actual data is an important part of **"Become Better Each Day"** and part of this training course.

This **Certified RCM Level 1** training course is the fundamental training for all team members. It covers the **37 RCM definitions** and the basics of the full RCM methodology in three days. RCM Level 1 is needed to start a RCM Level 2 training (RCM facilitator).

After the training course, the attendees will be able to:

- **Evaluate** the effectiveness of present maintenance plans
- **Assess** which assets or systems require the proper methodology to optimise maintenance
- **Determine** if current maintenance plans are developed in the right way
- **Measure** what is needed to continuously improve C.A.R.E.
- **Establish** new and optimise existing maintenance plans for high critical systems as a RCM team member
- **Develop** new and optimise existing maintenance plans for low critical systems with the Quick Maintenance (QM) methodology

Join us now and be prepared to take away key practices that will turn your organisation into a beacon of excellence.