



World Class Maintenance Management – The 12 Disciplines

Training modules and contents for in-house training

Maintenance is not an organization, it is not a department nor a function, but rather maintenance are humble and down to earth human beings so let us treat them with the respect that they truly deserve because that is all they ask for Rolly Angeles

Training Package Includes:

- Morning / Afternoon meals and Lunch
- Complete Handouts on WCM course
- Selected Articles on WCM
- Exercises and Handouts on WCM
- CD Softcopy of WCM Training in powerpoint
- Certificate of Attendance
- 1 complimentary copy of WCM book



Who Should Attend:

- Maintenance Managers
- Facilities and Utilities Managers
- Preventive/Predictive Maintenance Group
- Reliability Engineers and Managers
- Operations and Production Managers
- Management and Decision Makers
- Continuous Improvement Groups
- People in charge of their assets
- CMMS and Spare Parts Group
- People in charge of asset management
- Maintenance Planners, CMMS Groups

WCM Course Overview:

• Being World Class means the ability to compete any where in the world. World Class Maintenance Management simply means the art and science of managing maintenance resources performed by best in class industries from around the world. But in most industries, the question is often raised, is it really possible to control maintenance or the pressure over maintenance is controlling us? This 3 days training and workshop will outline the 12 Disciplines in order to improve equipment reliability. These Discipline are categorized into three stages, the basics, Strategies and Advance Disciplines. Learn what these disciplines are that most World Class Companies perform. All World Class Maintenance industries were not born World Class, they all started on being reactive themselves. Achieving World Class Maintenance needs much more than this, find out what World Class Maintenance is all about.



WCM Master Class. Abishek, Trident India, February 2011

One course tells it all!

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Email: rollyangeles@rsareliability.com

Website: <http://www.rsareliability.com>
Contact Number: +63920-482-8225



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WCM Course Objective:

- Understand the need for an effective and World Class Maintenance Management structure in our plant
- Understand the importance of establishing the basics of maintenance before adopting any improvement strategy
- Understand when to effectively use each of the different maintenance strategies in order to fully improve the equipment reliability
- Develop a Corporate Strategy for maintenance function
- Provide a basic understanding on the 12 Disciplines of Maintenance Management and understand the real focus of a true and meaningful Maintenance Structure
- Understand the real focus of a true and meaningful maintenance structure
- Learn what it takes to achieve a World Class Maintenance stage in your industry

This is not only a technical book about reliability and maintenance, it is a book that makes each maintenance feel proud they belong to the maintenance function



Rolly Angeles

What They Say About WCM:

- **No doubt, Mr. Rolly is an expert in maintenance field. I never came across such a beautiful learning ever.** Thanks to Mr. Rolly and my company BPCL. His thrust on lubrication, RCFA and RCM gave us another dimension to our thought process. From MP Agrawal DY Maintenance Manager, Bharat Petroleum, India
- **Presentation was very good. Knowledge & experience on the subject matter is excellent. Makes participants enjoyed the workshop.** Very useful at work place. The knowledge can be directly be used at our place of work. Pattern of course has been kept simple & understandable. Knowledge sharing is excellent. From Anant Kumar Gupta Senior Officer Maintenance / Electrical / Bhart Petroleum
- **The good point was that I came to know all about the recent development in the field of maintenance related equipment that will help me to know the consequences of failure of my equipment.** And also I came to know about the lubrication and its aspects and importance in the case of maintaining our equipments so lots of thanks to Mr. Rolly Angeles. From Pararnath M. Gosh Officer Mechanical Maintenance, Bharat Petroleum



**WCM Class, Meralco Power Academy
November 2017**

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What To Expect on this Training

- **Understand** the importance of performing the basic disciplines before advancing on any continuous improvement efforts and maintenance strategies
- **Learn** the diversity of failures and how it occurs and that not all parts will eventually wear out as most maintenance professionals assumed
- **Discover** how World Class Maintenance people think and what are their priorities and know the most important lessons to be learned from each of these 12 Maintenance Disciplines
- **Understand** the importance of Autonomous Maintenance and why these people are important in the overall maintenance strategy of the plant
- **Unfold** the secrets of lubrication and discover the ways and means to lengthen the life of your lubricant and parts
- **Learn** why Preventive Maintenance cannot capture all equipment failures and what maintenance can do about this. And much, much more

About the Resource Speaker

Rolly, is a seasoned international reliability and maintenance consultant with 29 years of solid experience in the field. He had been invited in different countries and have conducted reliability and maintenance trainings in United Arab Emirates, India, Malaysia, Indonesia, Brunei, Thailand, Nigeria, Bangladesh, South Africa, China and Botswana. His portfolio of maintenance trainings include Maintenance Management courses on TPM, Lubrication, Tribology, Condition-Based Maintenance, RCM, RCFA, Planned Maintenance, World Class Maintenance Management, The 12 Disciplines, Oil Contamination Control, Maintenance Indices and KPI's, Maintenance Management Strategies and much more. Rolly previously worked with Amkor Technology Philippines, as a TPM Senior Engineer, an industry engaged in the manufacture of Integrated Circuit products and spearheaded their Planned Maintenance organization com-pose of maintenance managers and engineers. He was also responsible for the dramatic reduction of unplanned breakdowns in their TPM Journey as well as RCM implementation on their Facilities AHU units and as well as their substation equipment. Rolly is currently working as an independent reliability and maintenance consultant. Rolly had released his first book on World Class Maintenance Management - The Twelve Disciplines.



Rolly Angeles – A Maintenance Preacher and Youtube Musician

Improving reliability is like playing the guitar the first time around, it takes time to become like them



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WCM Program Day 1 : Morning Session

Module 1: Understanding Equipment Failures

- The Truth About Machinery and Equipment
- Is It Really Possible to Eliminate Failures and Breakdowns on our Equipment
- What Maintenance is All About
- Common Belief on Maintenance – Does All Parts Eventually Wear Out
- What Stanley Nowlan and Howard Heap Discovered about Maintenance
- Limitations of Preventive Maintenance
- Understanding What Maintenance Can and Cannot Do
- Understanding Infant Mortality, Random and Age-Related Failures
- 6 Types of Failure Patterns
- Classification of Failures – Hidden and Evident Failures
- Types of Failures – Function Loss and Function Reduction Failures
- Occurrences of Failures – Sporadic and Chronic Failures

Registration Start : 8:15 to 8:30 am
 Start of Training : 8:30 am
 Morning Break : 10:15 to 10:30 am
 Lunch Break : 12:00 to 1:00 pm
 Afternoon Break : 3:15 to 3:30 pm
 End of Day 1 : 5:00 pm

World Class Maintenance well defined and an eye opener for maintenance staff whom are so caught up with daily job routine and pressure. Thanks to the instructor. Mr. Rolly who is very passionate on maintenance and brings out the value of maintenance. At least this course had enable me to be focused and know where to stand for my maintenance team. That is where basic discipline has been very applicable and beneficial. CD in powerpoint makes life easy for me to train my staff. Mr. Rolly leaves behind few moral stories and illustrations through videos which makes the class interesting. *From Calvin Chan, Service Manager, IT Services, Malaysia*

WCM Program Day 1 : Afternoon Session

Module 2 : Changing The Culture from Reactive to Proactive

- Reactive and Proactive Maintenance Explained
- Flowchart of a Reactive Maintenance Environment
- Learning the Correct Paradigm on Maintenance

Module 3 : Understanding World Class Maintenance Management

- World Class Maintenance Management Explained
- 12 Disciplines of Maintenance - Basics, Intermediate and Advance Discipline

Module 4 : Basic Discipline

- Discipline 1 : The Need for Training and Skills on Maintenance
 - Training and Skills Assessment
 - Steps to improve your current training needs
 - Reflections and Learning's from the first discipline
- Discipline 2 : Measurements and Maintenance KPI's
 - Most Common Mean Time Indicators
 - Understanding Mean Time Between Failure (MTBF)
 - Understanding Mean Time to Failure (MTTF)
 - Setting Maintenance Goals and KPI
 - Reflections and Learning's from the 2nd Discipline



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WCM Program Day 2 : Morning Session

Continuation on Module 4 : Basic Discipline

- Discipline 3 : The Need for Autonomous Maintenance
 - Why Autonomous Maintenance is Important
 - Autonomous Maintenance Basic Concept
 - Maintenance Guidance and Support for Autonomous Maintenance
- Discipline 4 : Addressing Basic Equipment Condition
 - Importance of Going Back to the Basics
 - Cleaning, Proper Lubrication and Tightening of Bolts
 - Role of Operators in Establishing Basic Equipment Condition
- Discipline 5 : Addressing Basic Equipment Condition
 - Preventive Maintenance Definition and Objective
 - What Preventive Maintenance Activities Includes
 - Feasibility of Using Preventive Maintenance for Age-Related Failures
 - Survey of Top 10 Problems on Preventive Maintenance

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 Afternoon Break : 3:15 to 3:30 pm
 End of Day 2 : 5:00 pm

It was very useful to recollect the basics of maintenance. Being a technical program, the way in which the faculty explained the concepts was very good and attractive. More positive insights were given during the presentation. The best part is that we are made aware of the lying human and latent cause behind any physical cause that leads to the failure. The learning materials provided & the case studies presented were very relevant and were very useful to the program. A complete transition/revolution in the maintenance approach attitude can be achieved through this program. The best part is that he used his passion to explain the concepts in such a beautiful way. *From R. Rjalaksham, Associate Manager Sterlite Industries, India*

WCM Program Day 2 : Afternoon Session

Module 5 : Maintenance Management Strategies

- Discipline 6 : Lubrication Strategy and Management
 - Function of oil and its composition
 - What cause oil to breakdown
 - Understanding how contamination occurs
 - Our Belief on Contamination and Contamination Control Awareness
 - Absolute and Nominal Filtration
 - Filtration Efficiency and Beta Rating of Filters
 - Oil Analysis – Level 1 Testing Oil's Health and Cleanliness
 - How to remove contaminants from oil
- Discipline 7: Understanding Life Cycle Management
 - Concept of Life Cycle Costing
 - Why the study of Life Cycle Costing is important
- Discipline 8: Spare Parts Management
 - Spare Parts Management Explained
 - Importance of Physical Inventory and Systems Inventory
 - Problems and Issues on Spare Parts
 - Importance of having a Spare Parts Management Strategy



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WCM Program Day 3 : Morning Session

Continuation on Module 5 : Maintenance Management Strategies

- Discipline 9: Root Cause Failure Analysis
 - Root Cause Failure Analysis Defined
 - Evidence – The Lifeblood of any Root Cause Failure Analysis
 - Difference between Failure Analysis RCA and RCFA
 - Levels of Root Cause – Physical Cause, Human Cause and Latent Cause
 - RCFA Case Study – Pump Failures
 - Reflections and learning’s from the 9th Discipline
- Discipline 10: Reliability Strategies
 - Understanding Reactive, Preventive, Predictive & Proactive Maintenance
 - Concept of Reliability-Centered Maintenance
 - How RCM is being Performed
 - Comparing TPM and RCM and what both of them believes
 - Reflections and learning’s from the tenth Discipline

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 Lunch Break : 12:00 to 1:00 pm
 Afternoon Break : 3:15 to 3:30 pm
 End of Day 3 : 5:00 pm

It was clearly defined and justified that maintenance is the backbone of any company/industry/business. Any fault or variance from a normal datum means a fault on the system management or process and not on the person. A very systematic approach of maintenance management with respect to maintenance personnel healthy life, ethics and spirit along with all of their co-workers. **From Nomer Ramboyong, Supervisor, Moog Control Corporation, WCM Master Class, Philippines**

WCM Program Day 3 : Afternoon Session

Module 6: Maintenance Management Advance Discipline

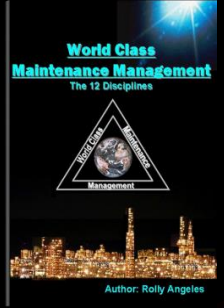
- Discipline 11: Understanding Condition Based Maintenance
 - Predictive Maintenance Defined
 - Understanding the P-F Interval
 - Potential and Functional Failure
 - Importance of determining Potential Failures
- Discipline 12: Computerized Maintenance Management Software
 - Purpose of CMMS
 - Application of CMMS
 - Role of CMMS in Maintenance Management
 - Considerations in selecting CMMS

Module 7: How to Apply the Twelve Disciplines of Maintenance

- Determine where your maintenance is right now
- Understand where you want to go
- Understand how will you go there
- Determine if you have finally arrived

Module 8: Learning’s from the 12 Discipline

- Closing Remarks on World Class Maintenance



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Serving Maintenance Mankind Worldwide . . .



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At RSA Reliability, We Serve Maintenance Mankind Worldwide . . .



WCM in Thailand
October 2013



WCM in Indonesia
June 2013



WCM in South Africa
June 2012



WCM in Malaysia
August 2010



WCM New Delhi, India
December 2010



WCM at EDC, Philippines
November 2011



WCM in Bangladesh
November 2009



WCM in India, Chennai
July 2008



WCM at Bharat Petroleum, India
September 2008

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Yet we are humbled by their feedback

- Very seasoned, experience, witty, humorous speaker and presenter. Very interactive and approachable speaker. Topic covered were generalized and the training lecture shall be suited to all branch of maintenance department, operating personnel and may also be covered under the training to make us understand the problems on maintenance. Case Studies narration is very practical and related to real life experiences. May God Bless Rolly For Philippines! From Moru Potom, Senior Engineer, Oil India Ltd.
- Overall forum for the two days was very good. The maintenance technique covered by Rolly in such a simple way was excellent. A lot of new things in maintenance I have learned from you. Now I will try to implement on our low level persons in my plant. From Bhagwat Singh Rathore, Assistant General Manager / Dalmia Cement Ltd.
- Very wide and thorough coverage of the subject. Facilitator is very thorough for both the theoretical and practical aspect. Very good presentation skills and excellent humorous person. It was really worth attending your class. We observed a very dedicated, knowledgeable personality in you. Only few maintenance personnel came up to your level. We hope to maintain in contact in the years to come and wish you all the best. From Ninan C.S. Chief Manager / Bharat Petroleum Corporation Ltd.
- No doubt, Mr. Rolly is an expert in the maintenance field. I never came across such a beautiful learning ever. Thanks to Mr. Rolly and my company BPCL. His thrust on lubrication, RCFA and RCM gave us another dimension to our thought process. From MP Agrawal, DY Maintenance Manager / Bharat Petroleum
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- The good point was that I came to know all about the recent development in the field of maintenance related equipment that will help me to know the consequences of failure of my equipment. And also I came to know about the lubrication and its aspects and importance in the case of maintaining our equipment so lots of thanks to Mr. Rolly Angeles. From Pararnath M. Gosh, Officer Mechanical Maintenance / Bharat Petroleum
- Thorough introduction of all disciplines in World Class Maintenance Strategy. Mr. Rolly delivers his extensive knowledge very well. It was easy to understand the concepts. This training, I feel will be the spark for our company in embarking on a world class management journey. From Izdinar Abd Hapiz, Assostant E & I Engineer, Makhostia Sdn, Bhd, Malaysia

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