



RELIABILITY CENTERED MAINTENANCE MASTER CLASS

**5TH RUN IN ASIA
BACK BY POPULAR
DEMAND!**

**27 FEBRUARY – 2 MARCH 2012
KUALA LUMPUR**



V Narayan
Former Head of Royal Dutch Shell Group's
Centre of Excellence in Maintenance and
Reliability Engineering, UK.

Author of "Effective Maintenance Management –
Risk and Reliability Strategies for Optimizing Performance",
Industrial Press Inc., New York.

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Putting Reliability back into RCM

Why do we have safety or environmental incidents? Is meeting the production target a hit-or-miss affair? How did the airlines achieve their remarkable safety record? Can we succeed on all three fronts **and lower maintenance costs** at the same time? Sounds incredible, but we can, and we will learn how to do so in this master class.

Business success depends on how well we manage risks. A plan to determine what to do and when to do it is a good starting point. Steven Covey, in his best-selling book, "The 7 Habits of Highly Effective People" tells us to move our thinking into the 'second quadrant' and be pro-active, systematic and organized. Maintenance, which helps us safely manage productive capacity, is no exception to this principle. We need risk based tools such as Reliability Centered Maintenance (RCM) to do this successfully.

It is not enough to understand how to analyse; we need to implement our plans well, as the fruits only come with the execution of work. This 5 day master class will discuss implementation hurdles and how to overcome them. Participants must be equipped with the basic theory, simplified maths and a real understanding of the terminology, calculation methods and application of the science.

Hear what previous participants have said about V. Narayan from his previous workshop in Asia:

"V.Narayan has transformed me inside out on the way I believed and think about maintenance!"

"Excellent fundamental course on that every maintenance practitioners must attend before embarking into a project."

"Well done, the course did really transform my point of view to a better understanding. This course is an essential and comprehensive guideline for people who are involve in Oil & Gas industry"

The best and thoughtful Reliability training I've ever attended

Well organized and interactive experience.

Previous participants include the following world-class energy organisations:

Petronas Carigali, Petronas Vinyl Chloride, Tasnee, Kuwait Oil Company, MMC Oil & Gas Engineering, ADGAS, Sarawak Shell, Talisman Malaysia, Brunei LNG, Murphy Oil Corporation, Oil India Limited, DIC (Malaysia), Bunduq Co Ltd, PTTEP, PETRONAS Penapisan, Petronas Carigali, Teknik Janakuasa, Vinyl Chloride Malaysia, Brunei LNG, Malaysia LNG, MTBE and many others

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Special features of this 5 day training course

Case study discussion with practical exercises and *not just theoretical concepts*

An ability to go back to the workplace and begin to apply RCM is central to learning in this training course. In the five-days, two days will be spent on working through a complex RCM study. This work will be done in teams working through syndicate sessions. The case is on a major sub-system of a large turbine, with data to be researched, as in real life. While the delegates struggle through the case, the instructor will be on hand to guide them through the maze. This is an ideal learning environment, where delegates will be stretched but not torn apart. There will be a number of class room exercises, some individual and others done in teams to help embed the learning

Examine Implementation Challenges of RCM

Analysis is always the easy part. Many RCM projects fail because there is not enough thought given to implementation and change management. In this workshop, we will spend time to discuss the soft issues that can affect effort to implement RCM results. Success criteria and pitfalls need to be well understood, so that will get attention.

Measurement and Justification of RCM projects

Engineers measure many things, but are usually poor at measuring their own performance. They seem unable to speak the language of the Board Room and put their case to senior management. Delegates will get guidance on these 'tough' topics.

Individual Attention and Post Training Support

Delegates will get individual attention, working in teams of four. Additional skilled and experienced trainers will be brought to help, if the numbers are larger, so as to maintain the teams to trainer ratio at about 4:1. Participants will have email access to the trainer 3 months post training for any questions on implementation issues.

Who should attend?

RCM is best done in teams; therefore we invite multi-disciplinary teams representing Operations, Maintenance Disciplines (Mechanical, Electrical and Instrumentation) from the Oil & Gas, Power Generation, Petrochemical and related Process Industries. You will benefit whether you are a supervisor, manager or specialist.

Each participant will also receive a copy of "**Effective Maintenance Management – Risk and Reliability Strategies for Optimizing Performance**" published by Industrial Press Inc., New York, is now in its third print run.

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Programme Approach and Agenda

There is a separately book-able introductory 2-day workshop where the RCM process will be discussed in sufficient depth to gain a good working knowledge. There will be a number of short exercises and one brief RCM exercise.

Those who seek a higher level of proficiency will continue into the 3rd day master class. The 3 days will feature a detailed case study on a plant sub-system. This is a simulated exercise, giving participants hands-on experience. Participants will then learn about implementation and measurement of results. From here participants should be able to justify RCM to senior management and get an RCM initiative started in their Company.

2- Day Introductory RCM programme,

Day 1	Duration/minutes
1. Introductions, expectations, house rules	30
2. Business Drivers and Maintenance	15
3. Piper Alpha video and discussion	45
4. Quantitative and Qualitative Risk	45
5. Historical background of RCM; the birth of risk based tools	15
6. Functions, Block Diagrams, Functional Failures	45
7. Evident and Hidden failures, Failure Modes	15
8. Exercise on Evident/Hidden failures	45
9. Histograms, Probability Density Function, Failure and Survival	60
10. Probability, Reliability-Exercise – computing Reliability Parameters	45
11. Summary and post-course assignment	15
Day 2	
1. Recap of day 1, clarifications on post- course assignment	15
2. Exercise – computing Reliability Parameters	45
3. Local and System Effects, Consequence categories	45
4. Exercise – Consequence Category selection	30
5. Applicable, Effective and Cost-Effective Tasks, Logic charts	45
6. Exercise – Kettle example	90
7. Sources of data	15
8. Selecting RCM Projects and Pilot studies	45
9. Review of course, Q & A, closeout. Post- course assignment for advanced course participants	45

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Advanced Programme to complete the RCM training

Day 3	Duration/minutes
1. Recap of day 1 & 2, clarifications from post-course work	15
2. RCM Exercise	120
3. Case Study description, rules	30
4. Syndicate work in breakout area, Functions and Functional Failures	45
5. Syndicate work in breakout area, Failure Modes, Effects, and Consequence Categories	90
6. Case Study and Failure Characteristics analysis	60
7. Review of case study, post-course work	15
Day 4	
1. Clarification and review of post-course work	15
2. Case Study, Failure Characteristics analysis, contd.	60
3. Case Study, Maintenance strategies	60
4. Closeout of Case study and discussion	60
5. Flight UA-232 Video and discussion	60
6. Task bundling, preparing maintenance routines	30
7. Managing Change, the bereavement curve	60
8. Review of case study, and post-course work	15
Day 5	
1. Recap of progress, clarifications on post-course work	15
2. Implementation of RCM results,	45
3. Execution Compliance and Quality	30
4. Measuring results	45
5. Justifying RCM work, making a Case for Change	30
6. Report writing	30
7. Other Reliability tools: RBI, IPF, FCA, FMECA, RBD, Modeling, RCA: where RCM fits in this suite	60
8. Software applications for RCM	30
9. RCM Facilitation and support	30
10. Summary and Closeout	30

Software

The focus on this training is on 'thought-ware' not software. Participants will learn to do RCM 'by-hand'. Software though, can help improve productivity and quality. We will discuss some of those currently available, so that delegates can consider their options logically.

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About your Expert Trainer – V. Narayan

V. Narayan retired from The Royal Dutch Shell Group of Companies in 2002, after a distinguished career in maintenance and project engineering.

As the Head of Maintenance Strategy Group, Shell UK Exploration and Production, he was involved in the following assignments:

- Created a new process and authored a standard to build in Reliability into new Projects. This process, called '**Operations in Projects**' is now extensively used in all major Shell Projects. This clear Business Process enables Shell to maximise Life Cycle Net Present Value by designing lean Plants with high Reliability.
- Created a comprehensive Reliability Database, using failure records from 15 Offshore Platforms over a 17 year period and applying Weibull analysis. It includes a Relief Valve Database analysing some 14000 test bench records, as well as one for Gas, Heat and Smoke Detectors.
- Managed the Internal Consultancy Services and later extended it to other Shell Companies as Head of Shell's Centre of Excellence for the E&P sector. Provided Training and Consultancy Services to Shell Companies in Brunei, Philippines, Argentina, Australia, Gabon, Nigeria and Oman.
- Was the Custodian of Shell Standards relating to Maintenance Strategy.
- Was a regular lecturer in RCM at the Shell Training Centre in Holland, conducting 14 sessions over an 8 year period.
- Carried out a Maintenance Review of Shell Gabon's Oil Production Facilities,

As Maintenance and Reliability Adviser, Shell International, The Hague, he was involved in the following:

- Created Shell's process and Performance Indicators, for Bench-Marking Maintenance Performance of Refineries and Gas Plants. **This methodology is still in use today.**
- Carried out a Maintenance Audit of Woodside Petroleum's LNG Plant in Western Australia.
- Coordinated the Shell Group Refineries participating in the external Bench-Marking studies conducted by Solomon Associates Inc.
- Facilitated a major Root Cause Analysis at a Shell Chemical Plant in The Netherlands.
- Carried out a review of a major Shutdown execution at Pernis, the **largest Shell Refinery**, identifying significant improvement opportunities. Many of these are now embedded in their planning process.
- Carried out an audit of the Planning of the largest Shutdown at Shell's Stanlow Refinery.
- Was a founder member of the Shell MERIT team, which made major improvements to Refineries' maintenance performance. Shell now sells this process to third parties.
- Identified best practices and opportunities for business improvement in fields of reliability, maintenance, inspection and projects in Shell Refineries, and Gas Plants.
- Created and edited Shell's Reliability Newsletter promoting best maintenance and operating practices and techniques worldwide.

He has published many articles and presented papers at International Conferences. He has worked in the upstream and downstream Oil and Gas Industry sectors as well as the Engineering and Pharmaceutical Industries. He has worked in several countries and cultures, including Saudi Arabia, India, Malaysia, Netherlands, and the United Kingdom. His book entitled Effective Maintenance Management –Risk and Reliability Strategies for Optimizing Performance was published by Industrial Press Inc., New York in April 2004, is now in its third print run. A second book entitled "100 Years in Maintenance and Reliability: Practical Lessons from Three Lifetimes at Process Plant" also published in early 2008 by Industrial Press Inc, NY.

He is currently on the faculty of Shell Open University and Robert Gordon University in Aberdeen for their MSc programme in Asset Integrity Management. His company, Effective Maintenance Ltd., was appointed Subject Matter Experts (SME) in 2007 by Reliance Industries Ltd., the largest company in India.

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REGISTRATION FORM

27 February – 2 March 2012 Kuala Lumpur, Malaysia	Early Bird Price	✓	Normal Price	✓	TEAM DISCOUNTS!
Reliability Centered Maintenance Master Class					PetroEdge recognises the value of learning in teams. Group bookings at the same time from the same company receive the following:
- Introduction Programme (2012)	S\$ 3950		S\$ 4150		3 or more at 5% off normal price
- Complete 5 Day Programme (2012)	S\$ 4750		S\$ 4950		5 or more at 7% off normal price
					8 or more at 10% off normal price
PetroEdge In-house Training { } Yes, I would like to organise this training on-site and save over 20% of total course fees! For further information about In-house Training Solutions, please call +65 67419927 or email info@asiaedge.net				Team discounts are exclusive of Early Bird offers and other promotions	

DELEGATE DETAILS

Delegate 1: _____
 Mr Mrs Ms Dr Other

Telephone: _____ Email: _____

Job Title: _____

Department: _____

Delegate 2: _____
 Mr Mrs Ms Dr Other

Telephone: _____ Email: _____

Job Title: _____

Department: _____

Head of Department: _____

Company: _____

Address: _____

Country: _____

Postcode: _____

Attention Invoice to: _____

Telephone: _____

Fax: _____

Email: _____

4 Easy Ways to Register

Online: www.petroedgeasia.net
 Email: info@asiaedge.net
 Phone: (65) 6741 9749
 Fax: (65) 6747 8737

Please note:

- indicate if you have already registered by Phone Fax Email Web
- if you have not received an acknowledgement before the training course, please call us to confirm your booking.
- photocopy this form to register multiple delegates.

Payment Methods

By Cheque/ Bank Draft: Make Payable to Asia Edge Pte. Ltd.
By Direct Transfer: Please quote AE1 with the remittance advise
 Account Name: **Asia Edge Pte. Ltd.**
 Bank Number: 508 Account Number: 762903-001 Swift Code: **OCBCSGG**
 All bank charges to be borne by payer. Please ensure that Asia Edge Pte Ltd receive the full invoiced amount.

PAYMENT POLICY: Payment is due in full at the time of registration. Full payment is mandatory for event attendance. I agree to Asia Edge Pte Ltd. payment terms

CANCELLATIONS & SUBSTITUTIONS: You may substitute delegates at any time. ASIA EDGE PTE LTD does not provide refunds for cancellations. For cancellations received in writing more than seven (7) days prior to the training course you will receive a 100% credit to be used at another ASIA EDGE PTE LTD training course for up to one year from the date of issuance. For cancellations received seven (7) days or less prior to an event (including day 7), no credits will be issued. In the event that ASIA EDGE PTE LTD cancels an event, delegate payments at the date of cancellation will be credited to a future ASIA EDGE PTE LTD event. This credit will be available for up to one year from the date of issuance. In the event that ASIA EDGE PTE LTD postpones an event, delegate payments at the postponement date will be credited towards the rescheduled date. If the delegate is unable to attend the rescheduled event, the delegate will receive a 100% credit representing payments made towards a future ASIA EDGE PTE LTD event. This credit will

be available for up to one year from the date of issuance. No refunds will be available for cancellations or postponements.

ASIA EDGE PTE LTD is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. ASIA EDGE PTE LTD shall assume no liability whatsoever in the event this training course is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, unforeseen occurrence or any other event that renders performance of this training course impracticable or impossible. For purposes of this clause, a fortuitous event shall include, but not be limited to: war, fire, labor strike, extreme weather or other emergency.

PROGRAM CHANGE POLICY: Please note that speakers and topics were confirmed at the time of publishing; however, circumstances beyond the control of the organizers may necessitate substitutions, alterations or cancellations of the speakers and/or topics. As such, ASIA EDGE PTE LTD reserves the right to alter or modify the advertised speakers and/or topics if necessary. Any substitutions or alterations will be updated on our web page as soon as possible.

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