Conscious Asset Management

The Aladon Network
THINK AHEAD

PEMMAX Consultants

Reliability Center, Inc.

Reliability Week in Toronto
RCM2 and PROACT® RCA

There are two ways to address reliability problems:

- Reliability Centered Maintenance 2 (RCM2) proactively determines what to do to prevent, predict or otherwise reduce the business and human consequences associated with un-expected failures
- PROACT® Root Cause Analysis (RCA) investigates "actual" equipment or process failures and finds ways to eliminate them or reduce their frequency

Reliability Centered Maintenance 2

3-day Workshop – Toronto, May 16th, 17th & 18th, 2011

8:00 AM – 5:00 PM, Continental breakfast, lunch and snacks provided

This course prepares you to carry out RCM2 analyses so that you can sustain high levels of production, safely and with the least risk of harming our environment. On the course you learn:

- How to correctly answer the seven questions required by SAE JA-1011 in performing RCM2 analyses
- How to identify the ways that your systems can fail to perform their functions and what you can do proactively, to avoid the consequences
- How to deal with those failures that cannot be avoided so that you minimize their consequences
- How to integrate RCM2 into your maintenance program successfully

Being proactive means you deal with problems before they happen. You can never be faulted for thoroughly considering the possibilities and taking steps to mitigate or eliminate consequences.

By defining equipment functions we can focus on what we want, not just on what it is. We discover the functions that are built-in, often taken for granted, not dealt with in conventional maintenance programs and often create big problems when failure strikes. We focus on what is important and deal with it proactively. Where that is not possible we consciously choose what other steps can be taken to keep failure consequences within the boundaries of what is tolerable.

RCM2 is an SAE JA1011 compliant methodology for the analysis of system and equipment that produces a comprehensive set of failure management strategies. Those strategies, when implemented, become your maintenance program. Typical RCM2 results include:

- Discarding existing preventive maintenance that actually results in more failures rather than fewer
- Increasing the predictive (condition based) component of your maintenance program
- Identifying where run-to-failure is your most beneficial strategy
- Identifying where equipment design simply cannot deliver the desired functionality and what to do about it

- Reducing maintenance program costs overall
- Increasing equipment reliability overall resulting in greater run times and
- Reducing risks to safety and to the environment that are inherent in your installed equipment and systems when they fail

The original RCM method was developed in the airline industry in the 1970's by Stan Nowlan and Howard Heap. It was responsible for significantly reducing aircraft failures and their often disastrous consequences by over 120%. It reduced the portion of equipment related failures from 66% to less than 15%.

RCM2 is the first industrial variant on that original method. It was developed by John Moubray and is the only industrial method developed under the tutelage of Stan Nowlan. It is robust, thorough and if followed properly even mistakes made in the analysis become apparent to the analyst so they can be corrected before the errors make it into your maintenance program. RCM2 has been and remains the "gold standard" of successful RCM methods – it is the one that other methods and derivatives are compared to.

RCM2 requires the first-hand knowledge of equipment operators and maintainers supplemented by failure data. But it is not data dependent. Even if your maintenance records and data base are of no help or non-existent, the method works well. Assumptions are noted and can be monitored after decisions are implemented. Those decisions are validated and improved as knowledge is gained. RCM2 is the best method to use for your mission, safety or environmentally critical systems. We introduce you to a decision making method for where to use RCM2 and where to use its quicker but less rigorous cousin, MTA (Maintenance Task Analysis).

RCM2 is excellent for use in new installations at the design stage where inherent problems uncovered by the method can be addressed before systems are built. In fact, this is how the military, airline and nuclear industries use the method.

The workshop is highly interactive – you will discover how much you already know but had not yet applied. It includes:

- A discussion of the business and other reasons why a rigorous failure management strategies are needed and how RCM2 provides them
- Discussion of conventional maintenance practices and how they miss the mark
- Detailed instruction and case study practice for each of the seven steps in the SAE JA-1011 compliant RCM2 method. You learn what to do, how to do it and you get to practice each of the steps
- A successful project method for implementing RCM2 in your organization.
- What to do to keep the results of your work valid when changes occur after the analysis is completed and how to do it
- Frequent discussions of your specific problems and typical scenarios encountered and how to deal with them

You also get:

- A copy of John Moubray's "Reliability Centered Maintenance 2" text.
- Case study worksheets (used in the workshop) and model solutions
- RCM2 decision diagram and other useful analysis tools

Instructor

Leonard G, Middleton, P.Eng., MBA, PMP has over 35 years of professional experience working in a number of industries and works as a management consultant and trainer working with international clients to improve their organizational performance through improved management of their physical assets. He is a frequent presenter at public conferences as well for client specific training. He is a certified and experienced RCM2 Practitioner. He publishes a regular newsletter on topics relating to asset management

The Aladon Network

Aladon, originally founded by John Moubray, maintains and enhances the RCM2 methodology, related training materials, licenses and certifies RCM2 Practitioners. The Aladon Network is a global group of those RCM2 Practitioners who deliver RCM2 training and its related services to clients around the world. Collectively we have delivered this training to over 60,000 people in over 80 countries.

Together with its simplified derivative, MTA, RCM2 and RCA form the basis for sustainable reliable performance from your physical assets.

PROACT® Root Cause Analysis Methods

2-day Workshop – Toronto, May 19h & 20th, 2011

8:00 AM – 5:00 PM, Continental breakfast, lunch and snacks provided

This course provides the knowledge necessary to uncover and eliminate the root causes of any major industrial problem. Participants will acquire a thorough understanding of the reliability concepts and learn the PROACT ® Root Cause Analysis (RCA) Methods, these are:

- Modified FMEA (Failure Mode and Effect Analysis) also called OA (Opportunity Analysis), used to identify and rank problems
- PROACT® RCA, to uncover root causes of the problems
- PROACT® Action Plan, to implement solutions to eliminate root causes of the problems

These methods are ideal for solving equipment and process problems but, they can also be used to eliminate any other problem or deficiency.

Modified FMEA or OA

Typically, in industry, 80% of the losses are caused by 20% of the repetitive problems (significant few). The objective of the OA is to determine the magnitude of the losses for each of the significant few problems, in order to prioritize the improvement efforts. Typically, an OA is carried out by 2 or 3 people; it takes about one week and includes:

- Defining “loss” and “area of concern”
- Listing main problems (actual, not potential)
- Estimating business loss for each problem
- Ranking problems by economic impact on the organization

The top ranking problems are candidates to be analyzed first, using RCA.

Note: any opportunity for improvement (e.g. increase production by 10%) can be included in the above list and be analyzed exactly the same as a problem.

PROACT® RCA

PROACT® RCA is based on deductive logic and uses a logic tree to display the cause and effect relationships. The tree top consists of the event definition and symptoms of the problem, the body of the tree includes all the hypotheses and verifications and the bottom of the tree includes the Physical, Human and Latent root causes. Typically, a RCA is carried out by a multi-disciplinary team (5-7 people), it takes more than two weeks and includes:

- Selecting the analysis team, defining the problem and collecting failure data
- Searching for correlation of failures with maintenance interventions, operational parameters, equipment modifications, etc.
- Analyzing the event using the logic tree, this includes:
    - Visualizing hypotheses for failure modes and verifying or disproving these hypotheses. When a hypothesis is true it becomes a failure mode
    - Repeating hypothesis-verification cycle as many times as necessary, until physical causes are uncovered that, in the criterion of the team, should be eliminated
    - Continuing the analysis to uncover Human and Latent root causes
    - Creating detailed descriptions of recommendations

PROACT® Action Plan

The recommendations generally include changes in procedures and/or equipment design. Since the analysis team is responsible for the elimination of the root causes, it must lead/facilitate the implementation process, this includes:

- Developing the recommendations
- Determining the cost and benefit of each major recommendation
- Preparing the Implementation Plan
- Implementing recommendations
- Tracking results
- Optimizing solutions

Proven Method

For the past 25 years, our former students have repetitively proven that when problems are solved with outstanding results, operations become more stable and emergency workload for hourly and supervisory personnel decreases. This generates enthusiasm, at all levels of the organization, to do additional analyses that lead to further improvements. This continuous improvement cycle is self-sustaining and provides exceptionally high Return-On-Investment.

The workshop is very interactive and includes:

- A detailed presentation of the concepts and benefits of Reliability
- A thorough understanding of the three PROACT® RCA methods outlined above
- Several cases **facilitated by the instructor** that highlight the power of the methodologies and motivate the participants to achieve similar results
- Analyses of problems brought to the classroom by the participants, to be dissected and often solved.
- One of the above problems will be analyzed in our proprietary PROACT® Software

You also get:

- A PROACT® Methods Manual that is an excellent reference for setting-up a Reliability program in your company
- A set of Job Aids that can be posted in job areas to encourage the use of these methods

Instructor

Tony Rodriguez, P.Eng. has been solving industrial problems for over 30 years, the first half in maintenance and engineering positions and the other half working as a Management Consultant for Maintenance, Engineering and Production. He facilitates improvement programs using PROACT® RCA, Reliability Centered Maintenance (RCM), Total Productive Maintenance (TPM) and UPTIME Maintenance Management; he also teaches these methods in public and in-house workshops. In 2002, Tony founded PEMMAX CONSULTANTS to help asset-intensive companies in solving major process-and-equipment problems. Pemmax Consultants has an alliance with Reliability Center Inc. to promote, teach and sell their reliability courses and software in Canada.

Reliability Center Inc. (RCI)

RCI was established in Hopewell, Virginia in 1972 as a Research and Development arm of a major US corporation. In 1985, RCI became an independent company under the direction of the late Charles J. Latino, whose goal was to spread the reliability message to companies all over the world. RCI teaches companies how to improve Equipment and Process Reliability using PROACT® Root Cause Analysis and Human Error Reduction methodologies. These methodologies and software are saving corporations millions of dollars every year. PROACT® is a registered trademark of Reliability Center, Inc.

Who should attend?

These workshops are ideal for Problem Solvers (engineers, maintainers, technologists,) involved in solving chronic and sporadic problems, and also for Leaders involved in continuous improvement programs; participants are typically from:

Maintenance	Operations	Reliability	Engineering
Process Control	Quality Assurance	Environmental	Safety

Participating Companies Include

Agrium, ArcelorMittal, Algoma Steel, ATCO Electric, ATCO Electric, AutoEver Systems, BC Hydro, Bruce Power, Canadian Coast Guard, Canbra Foods (Richardson Oilseed), Cardinal Power, Chevron Shipping, Earth Tech, EnCana, Epcor, Greater Vancouver Regional District, Husky Injection Molding, I/N Tek I/N Kote, Iron Ore Company, Michelin, Moa Nickel, Nova Chemicals, Owens Corning, Pemex, Polinter, PowerStream, Prairie Mines and Resources, Praxair, PT Inco, Seejoong Consulting, Sherritt International, Sita Canada, Suncor, Sykes Canada, Tetra Pack, Toronto Hydro, Toronto Water, Toyota, TransCanada, Waterville TG, TTC, WestJet, Weston Bakeries,

Make these Reliability Methods the cornerstone of your Continuous Improvement Program!

Reliability Centered Maintenance (RCM) &
Root Cause Analysis (RCA) Workshops in Toronto - 2011

Registration Fees per Participant

workshop/s	# participants	select one (✓)	dates	fees	HST (13%)	total ($CAD)
RCM2 + RCA	any		May 16 - 18	3,000.00	390.00	3390.00
RCM2	1		May 16 - 18	1,950.00	253.50	2203.50
RCM2	>1		May 16 - 18	1,800.00	234.00	2034.00
RCA	1		May 19 & 20	1300.00	169.00	1469.00
RCA	>1		May 19 & 20	1200.00	156.00	1356.00

name (1)_____ title _____email_____

name (2)_____ title _____email_____

name (3)_____ title _____email_____

company_____division_____

address_____

city_____province_____postal code_____

phone:_____fax:_____total amount payable $ _____

Note: Participant substitutions allowed anytime

Payment Option 1 (mail/email) - Purchase Order or Cheque

Payable to Pemmax Consultants, please mail to:

PEMMAX CONSULTANTS
Attn: Isabel Meza
317 Amberwood Drive
Waterloo, Ontario, Canada, N2T 2E9

Payment Option 2 (on-line) - Visa, MasterCard, Amex, Bank Account

Please select who should receive the electronic invoice with payment instructions:

☐ Individual participants
☐ Mr./Ms. _____ Email _____

For registration, please Email or fax this form to workshop coordinator
Isabel Meza imeza@pemmax.com, Fax: (519) 208-7790, Phone: (519) 888-9970

For course details, please contact the instructors:
James Reyes-Picknell james@consciousasset.com & Tony Rodriguez arodriguez@pemmax.com