



# PROACT<sup>®</sup> Root Cause Analysis Methods

## 2-day Workshop

Toronto – September 28<sup>th</sup> & 29<sup>th</sup>, 2010

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<sup>®</sup> 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<sup>®</sup> RCA, to uncover root causes of the problems
- PROACT<sup>®</sup> 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<sup>®</sup> RCA

PROACT<sup>®</sup> 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<sup>®</sup> 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 Methods

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.

## Workshop (8:00 AM – 5:00 PM, Continental breakfast, lunch and snacks provided)

The workshop is very interactive and includes:

- A detailed presentation of the concepts and benefits of Reliability
- A thorough understanding of the three PROACT<sup>®</sup> 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<sup>®</sup> Software

**Every participant will receive: 1) a PROACT<sup>®</sup> Methods Manual that is an excellent reference for setting-up a Reliability program in your company, 2) a set of Job Aids that can be posted in job areas to encourage the use of these methods and 3) a CD with presentation material to pass on the new knowledge to colleagues and subordinates**

## Who should attend?

This workshop is ideal for Problem Solvers (engineers, technologists, analysts) 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

# Participants' Comments

**"PROACT® RCA Methods seminar ranks among the best training I have ever taken. It is excellent in terms of teaching practical techniques that can be applied as soon as you return to work"**

Peter Girard, Maksteel

**"Using PROACT® Root Cause Analysis at our site will pay huge dividends"**

Murray Culham, Honda

**"PROACT® RCA methodology is a very valuable tool for the elimination of significant chronic problems"**

Perry Howse, TTC

**"Tony Rodriguez was truly excellent as a course leader, one of the best. He is positive, open minded, encouraging and very knowledgeable"**

Darren Holmes – Shell Canada

**"The workshop is excellent and provides all the necessary knowledge to initiate a Reliability Program"**

Robert Blain – Barrick Gold Corporation

## Participating Companies Include

Algoma Steel, ATCO Electric, Bruce Power, Cardinal Power, EnCana, Epcor, Husky Injection Molding, Iron Ore Company, Michelin, Moa Nickel, Nova Chemicals, Owens Corning, Pemex, Polinter, Praxair, PT Inco, Sherritt International, Sita Canada, Sykes Canada, Tetra Pack, Toyota, Waterville TG, WestJet, Weston Bakeries

## 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.

**Make PROACT® RCA Methods the cornerstone of your  
Continuous Improvement Program!**

# Registration Form

## Fees – PROACT® Root Cause Analysis Methods Workshop

Individual participants: \$1,300.00 CAD + HST

Multiple participants (same company): \$1,200.00 CAD + HST

Participant substitutions allowed anytime

### Participants:

Name (1) \_\_\_\_\_ Title \_\_\_\_\_ Email \_\_\_\_\_

Name (2) \_\_\_\_\_ Title \_\_\_\_\_ Email \_\_\_\_\_

Name (3) \_\_\_\_\_ Title \_\_\_\_\_ Email \_\_\_\_\_

Company \_\_\_\_\_ Division \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Province \_\_\_\_\_ Postal Code \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Total amount payable \$ \_\_\_\_\_

### Workshop

- Toronto – September 28<sup>th</sup> & 29<sup>th</sup>, 2010

### Preferred Payment Option

Purchase Order    Cheque

Payable to Pemmax Consultants, please mail to:

PEMMAX CONSULTANTS  
317 Amberwood Drive  
Waterloo, Ontario, Canada, N2T 2E9

### Alternative Payment Option – via PayPal

Visa    MasterCard    Amex

If you have a PayPal account you can pay directly on-line <http://www.pemmax.com/training.html>

If you do not have a PayPal account and wish to pay on-line, please contact Isabel at (519) 888-9970

### Contacts

Phone: (519) 888-9970, Fax: (519) 208-7790

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