

# **Operations Excellence**

through an Organic Australasian approach to

## **TPM & Lean / CI**

16 April 2015

## **Ensuring New Equipment is User Friendly**



Presentation by:  
**Ross Kennedy**  
**President CTPM**





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## **Outline of Presentation**

### **Ensuring New Equipment is User Friendly**

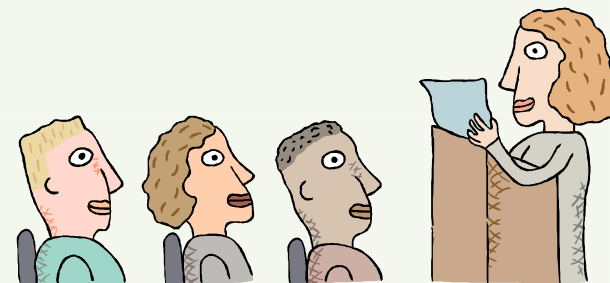
1. Why 'user friendly' is as important as functionality
2. Having the right team that understands Standardisation, Trainability, Operability, and Maintainability
3. Using checklists to capture experience and learning
4. Developing the right training

# Traditional approach to New Equipment

- Senior Management decide that new equipment is required
- Project Engineering is given the task to scope out the work and arrange any contracts required
- Purchasing are given a Bill of Materials and requested to buy the new equipment not supplied by the contractors
- Equipment arrives and is installed
- Project Engineering arranges for Commissioning then hands over to Production
- *Maintenance gets called when it doesn't work*
- *Production and Maintenance then battle to get new equipment to perform as expected*
- *Project Engineering don't want to know about any problems because they are busy with the next project*



# *Ask the Audience*



## 1. Why 'user friendly' is as important as functionality

**Engineers** traditionally look at ***Functionality*** as the prime objective of design and often pay limited attention to:

***Standardisation;***

***Trainability;***

***Operability;*** and

***Maintainability***

which all impact on the '***user friendliness***' of the equipment

<b><i>User Friendly:</i></b>	Easy to Train
	Easy to Operate
	Easy to Identify Defects
	Easy to Monitor Condition
	Easy to Maintain



# 1. Why 'user friendly' is as important as functionality

**Procurement** traditionally look at **price** as the prime objective of selecting suppliers and often pay limited attention to Life Cycle Cost which is impacted by:

***Standardisation;***

***Trainability;***

***Operability;*** and

***Maintainability***

which all impact on the '***user friendliness***' of the equipment

<b><i>User Friendly:</i></b>	Easy to Train
	Easy to Operate
	Easy to Identify Defects
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# 1. Why 'user friendly' is as important as functionality

<i>Requirement</i>	<i>User Friendly Examples</i>
<i>Standardisation</i>	<ul style="list-style-type: none"><li>• Isolation mechanisms and procedures</li><li>• Fastener thread type (metric, imperial etc)</li><li>• Fastener head type (slot, Phillips head, hexagonal etc)</li><li>• Fastener sizes (minimise)</li><li>• Fastener locking mechanism (spring washer, nylock nuts etc)</li><li>• Pneumatic Control valves</li><li>• Pneumatic Air Service units</li><li>• Pneumatic Gauges and operating range markings</li><li>• Hydraulics</li><li>• Motors</li><li>• Electrics</li><li>• Transmissions (gearboxes etc)</li><li>•</li></ul>

# 1. Why 'user friendly' is as important as functionality

<i>Requirement</i>	<i>User Friendly Examples</i>
<i><b>Trainability</b></i>	Easy to understand and comprehensive: <ul style="list-style-type: none"><li>• Isolation Procedures</li><li>• Pre-start Checklists</li><li>• Standard Operating Procedure</li><li>• Work Instructions</li><li>• Job Breakdown Sheets</li><li>• Standardised Worksheets</li><li>• Performance reporting</li><li>• Handover procedure</li></ul>



## 1. Why 'user friendly' is as important as functionality

# Defining 'User Friendly' - Operability

**Making equipment so it is easy for:**

1. Operators to identify process and quality problems at the earliest possible time
2. Operators to identify equipment defect at the earliest possible time
3. Operators to conduct Set-ups and / or Changeovers in the shortest possible time

**Remember!**

***Make it easy to do right and difficult to do wrong***

# 1. Why 'user friendly' is as important as functionality

<i>Requirement</i>	<i>User Friendly Examples</i>
<b><i>Operability</i></b>	<ul style="list-style-type: none"><li>• Easy to isolate equipment</li><li>• Easy to operate equipment</li><li>• Easy to identify equipment defects eg matched marking of key fasteners</li><li>• Easy to access for Cleaning eg off the floor</li><li>• Easy visibility to see condition of key components eg see-through guarding</li><li>• Easy to access for Inspecting eg quick release and interlocked guarding</li><li>• Easy to identify conditions that could lead to quality problems</li><li>• Easy to monitor equipment condition eg operating range marked on all gauges</li><li>• Easy to conduct Set-ups and Changeovers</li><li>• Easy access and mistake proofing of changeover parts</li><li>•</li></ul>

# 1. Why 'user friendly' is as important as functionality

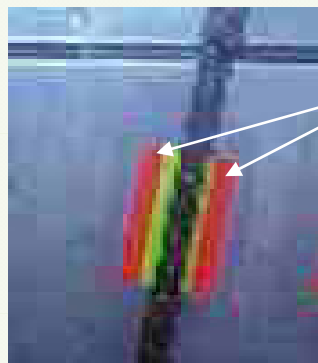
<i>Requirement</i>	<i>User Friendly Examples</i>
<i><b>Maintainability</b></i>	<ul style="list-style-type: none"><li>• Easy to access for Servicing</li><li>• Easy to diagnose problems eg built in diagnostics like a photocopier</li><li>• Easy to monitor condition while running</li><li>• Maximum life of components to reduce Planned Downtime</li><li>• Exchange-out of wear parts and rotables so repairs can be completed within 1 hour during regular Clean for Inspection time</li><li>• Excellent documentation that explains the functioning of the equipment (to allow easy development of One Point Lessons for training operators)</li><li>• Clear identification tagging of equipment so Operators can easily explain where problems are</li><li>•</li></ul>

## 1. Why 'user friendly' is as important as functionality

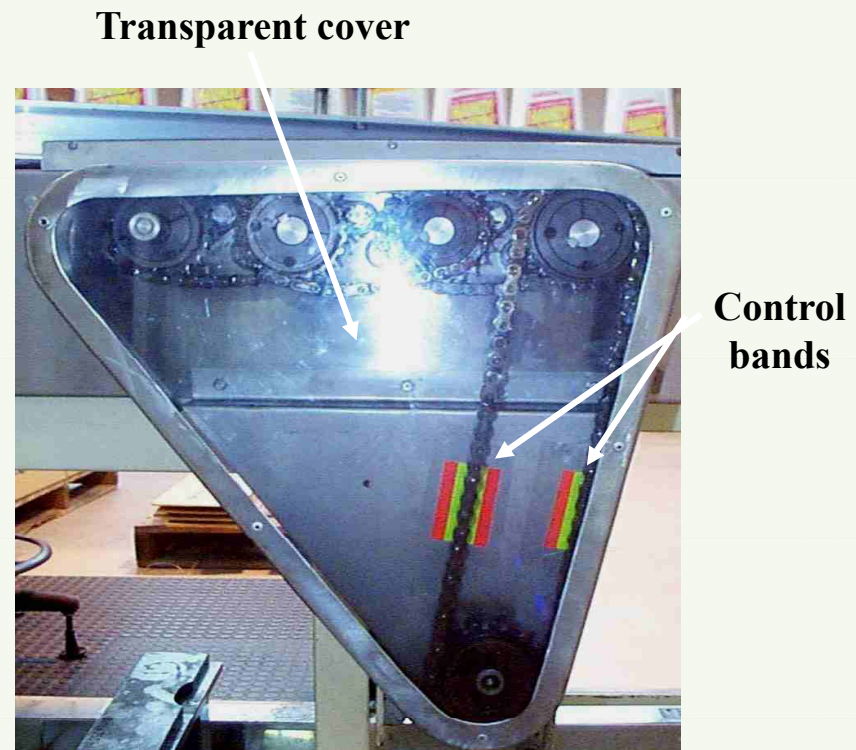
# Sample "User Friendly" - Visual Controls



Green band indicates permissible range for distention



Red band indicates inadequate range of distention – chain needs tension



**Chain tension visual check**



## 2. Having the right team that understands Standardisation, Trainability, Operability and Maintainability

### The 5 Stages of **New Equipment Management**

- |                |  |
|----------------|--|
| <b>Stage 1</b> | <b>Design</b> ( <i>Specification &amp; Performance</i> )         |
| <b>Stage 2</b> | <b>Procure</b> ( <i>Purchase, Transport &amp; Store</i> )        |
| <b>Stage 3</b> | <b>Accept</b> ( <i>Factory Test &amp; Receipt Test</i> )         |
| <b>Stage 4</b> | <b>Install &amp; Commission</b> ( <i>Production Acceptance</i> ) |
| <b>Stage 5</b> | <b>Perform, Monitor &amp; Learn</b> ( <i>Post-Launch</i> )       |



## 2. Having the right team that understands Standardisation, Trainability, Operability and Maintainability

### Overview of the New Equipment Management (NEM) Cross-functional Teams

Stage	Team	Purpose
1	Macro NEM - Design (Spec & Performance)	Develop specification for procuring a New Production Line / Process / Plant eg New Bottling Line
	Micro NEM - Design (Spec & Performance)	Develop specification for procuring a section or piece of New Equipment eg New Filler for Bottling Line
2	Special Micro NEM - Procurement	Identify supplier(s) and arrange purchase contracts, transport and storage
3	Special Micro NEM - Compliance Test	Conduct compliance testing of New Equipment before leaving factory and as it arrives at site
4	Special Micro NEM - Install & Commission	Install and Commission New Equipment and if necessary, modify to ensure it is <i>"User Friendly"</i>
Post Launch using CI Teams		
5	WAM / OEM - ABTs and FE&PI – XFTs	Performance, Monitor and Learn through rapidly progressing Work Area Management and the 7 steps of Operator Equipment Management Area Based Team (ABTs) activity supported by Focused Equipment & Process Improvement Cross-functional Teams (XFTs)

## 2. Having the right team that understands Standardisation, Trainability, Operability and Maintainability

### Typical Team Members (4-8)

Project Engineering

Production

Maintenance

Quality

Training

Procurement

*Need to ensure some members have TPM & Lean implementation experience especially Operator Equipment Management steps 1 -5*

### 3. Using checklists to capture experience and learning

#### Sample Checklist to assess “User Friendly” Operability of Equipment

Use the Checklist below to identify opportunities to enhance the operability of the equipment so as to make it easier to operate and minimise operator error

No.	Operability Issues	Required		Comments
		✓	X	
	<b><i>A. Ease of Operation</i></b>			
1	Operator work station posture to site standard			
2	Control knobs easy to operate			
3	Handles easy to operate			
4	Adequate Inspection ports			
5	Adequate Service ports			
6	Manual jog mode for fault finding			
7	Easy to understand operating procedures			
8	Comprehensive operating procedures			
9	Operating procedures to site standard			
10				
	<b><i>B. Ease of Changeovers / Set-ups (SMED)</i></b>			
1	Setting points and adjustment marks			
2	Automated pre-heating and cooling			
3	Manual jog mode for setting and fault finding			
4	Locating devices			
5	Centring Jigs			
6				

## **4. Developing the right training**

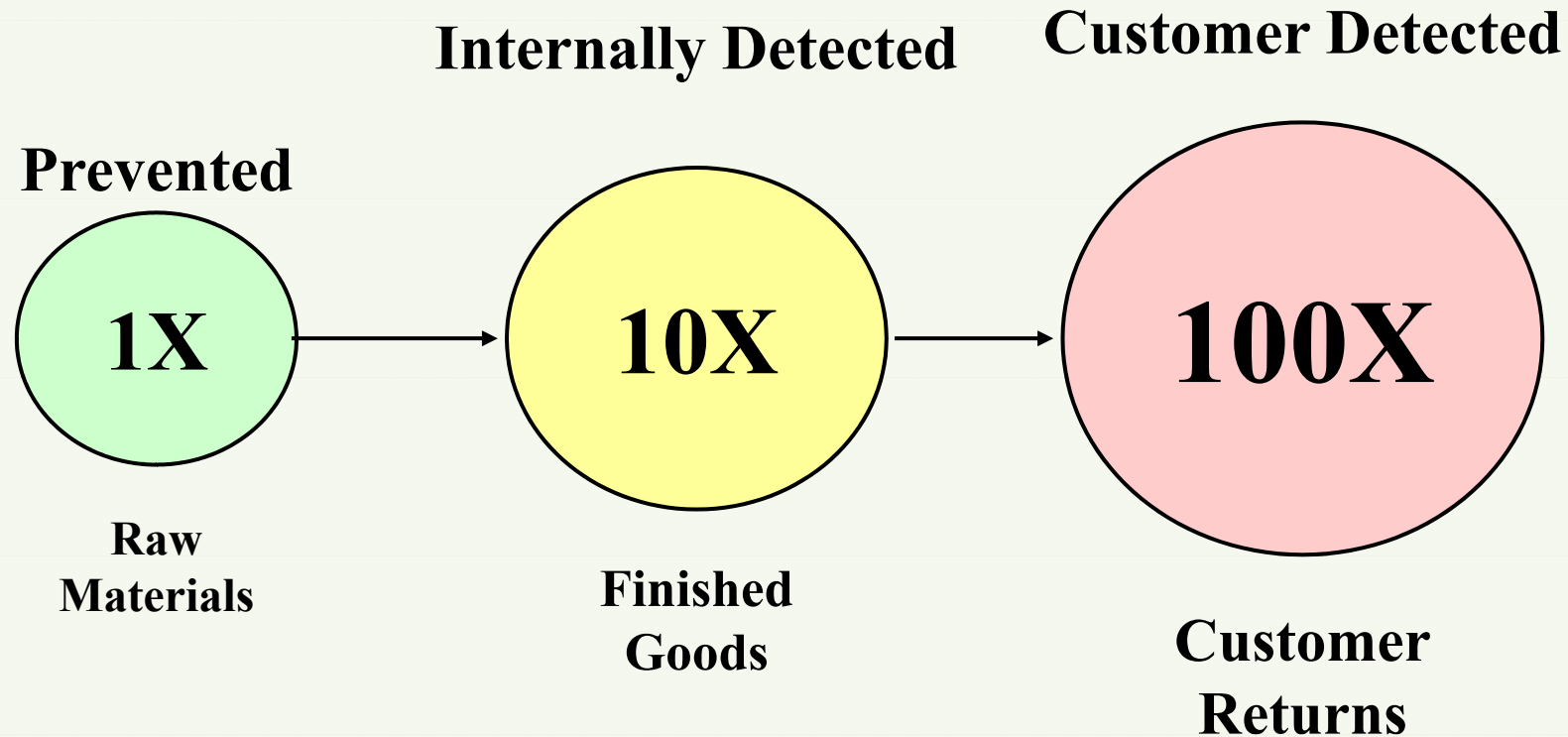
### **Key Concepts for New Equipment Management**

- 1. User Friendly**
- 2. Prevention at Source Design**
- 3. Compliance Testing by Competent People**
- 4. Life Cycle Costing**

# Prevention at Source

*Finding Problems at Earliest Possible Time*

The cost of Product Defects when they are:

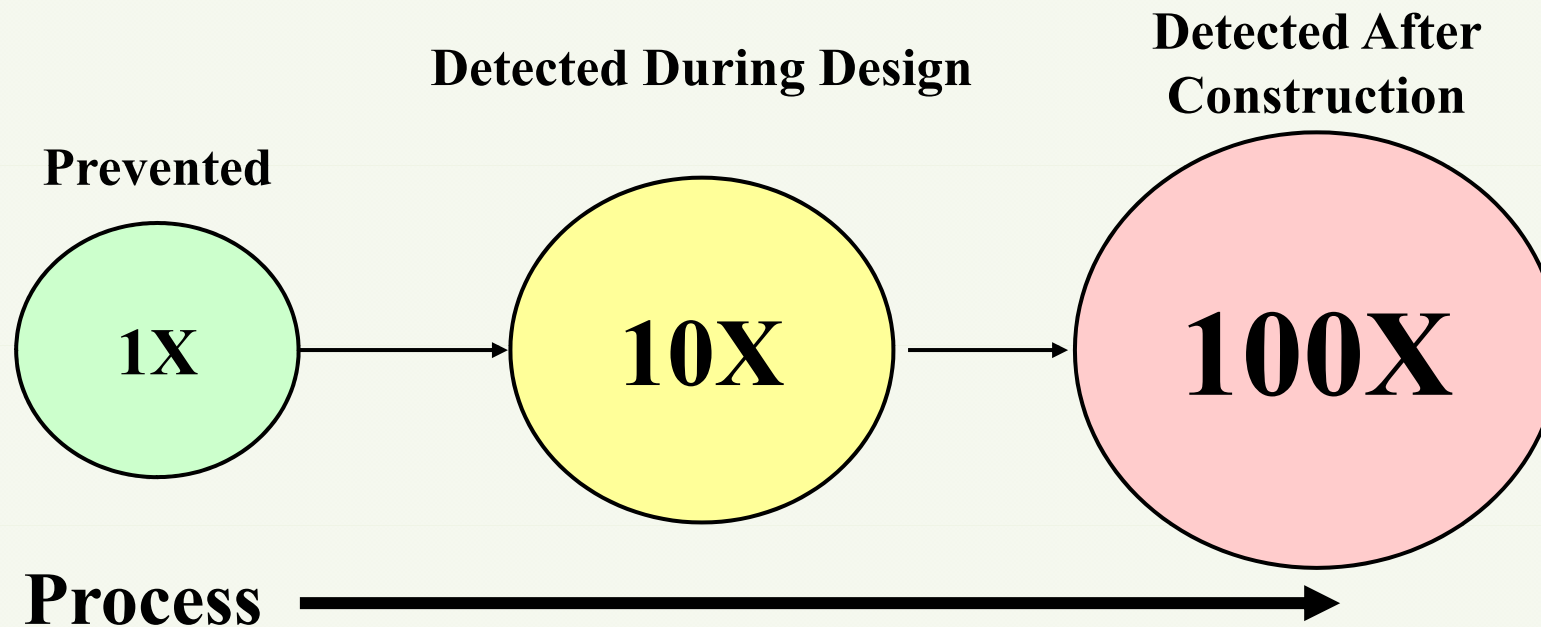




# Prevention at Source Design

## (Design Defect Avoidance)

The cost of Design Defects when they are:



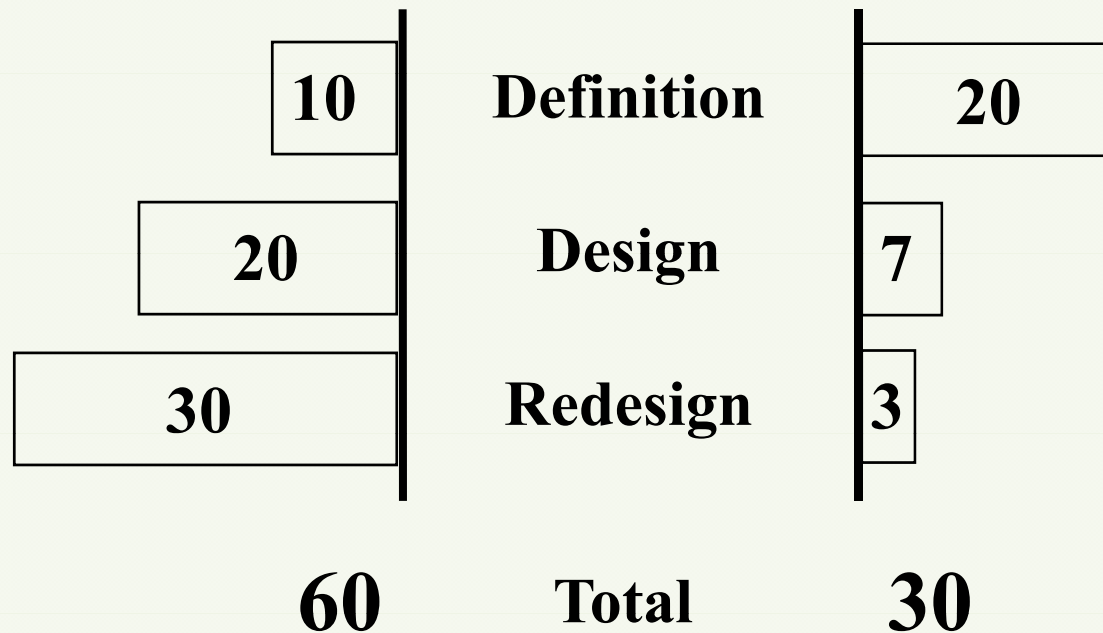
Prevention at Source Design involves getting all affected parties involved at the earliest possible time to use their collective experience to create a detailed design specification.

# Prevention at Source Design approach being applied

**Shipbuilder A**  
(Traditional approach)

**Shipbuilder B**  
(Prevention at Source approach)

**Thousands of man-hours**



# Compliance Testing by Competent People

The 2 Stages of Compliance Testing:

- At the manufacturer's premises
- Immediately after it arrives at your site

## **At the manufacturer's premises:**

Does the equipment comply to the detailed specification for functionality, operability, maintainability, standardisation and trainability?

## **Immediately after it arrives at your site:**

Has the transporting of the new equipment caused any problems?

Has everything arrived that should have arrived?

***The people will operate and maintain the equipment should also be involved in the compliance testing***

# Life Cycle Costing – The ‘driver’ for New Equipment Management

Equipment Focused **TPM** uses Overall Equipment Effectiveness as its driver for improvement, while Process Focused **Lean** uses Lead Time Reduction as its driver for improvement

The most effective driver for New Equipment Management is **Life Cycle Cost**. This is the **Total Cost** from inception to disposal of the equipment.

By evaluating each option for the New Equipment based on its impact on Life Cycle Cost, the team can evaluate based on long term thinking supported by facts and data rather than short term cheap options that may cost considerably more over the life of the New Equipment.

# Final Word

New Equipment Management, through a series of Cross-functional Teams, allows you to apply TPM & Lean experience to new equipment designs and installations so as to minimise ***Life Cycle Cost*** while creating a ***User Friendly*** workplace

A key part of New Equipment Management is ***Prevention at Source*** design activities so as to minimise start up problems and costs.



# How can we help you develop your in-house capability?


**Assisting you to develop your people through CI - People before Tools**

## Connecting the CI Community of Australasia through CTPM's new Company Membership Program

CTPM has been assisting Australian and New Zealand companies on their Continuous Improvement journeys for 20 years, over which time we have built up a significant knowledge base and network.

We believe it is now time to share with the broader CI Community of Australasia to ensure all companies are able to further develop their in-house CI capability.

Previously this knowledge base and network has been restricted to clients, now CTPM is opening access to this via an exciting new CTPM Company Membership Program.

The program is open to any site or department wishing to learn more about CI by sharing their learnings to the mutual benefit of Australasian Industry.

A key focus of our approach is to facilitate learning between sites or departments when it is convenient for all concerned, rather than be prescriptive with a set of pre-arranged events.



**NEW & FRESH APPROACH**

**Flexible Networking and Learning**

**Keeping you up to date on latest Thinking & Events**

**Exclusive Access to 3 Key Enablers of Successful CI Capability**

**BENEFITS OF MEMBERSHIP**

Total flexibility to suit your specific needs

Opportunity to develop relationships with other sites or departments facing similar challenges or who have overcome the challenges you face

Access to the knowledge of our team of experienced CI Specialists who collectively have 135 years industry experience; 60 years consulting / facilitating / training experience and 50 years at CTPM

Access to over 12 years of benchmarking data on Australasia industry with simple tools to assess how your site compares in relation to Quality, Delivery, People Engagement, Maintenance Effectiveness and Workplace Culture



**CTPM Company Membership has an annual fee of \$200 (Incl GST) per site or department**

**Special Offer: 50% Discount for the first year of Membership (available until 30 June 2015)**

[www.ctpm.org.au](http://www.ctpm.org.au)

## Features of CTPM Company Membership

**Flexible Networking and Learning**

- Over the phone or email discussion about your networking and learning needs
- Matching your needs to other members to arrange introductions for you so that there can be sharing of learning through networking (eg site visit)
- Over the phone or email advice on Continuous Improvement from our team of experienced CI Specialists

**Latest Thinking and Events**

- Monthly CTPM E-News covering articles about members CI activities and upcoming events
- Monthly Webinar (30 minutes) on a topic of Continuous Improvement which is recorded and can be accessed later from our website (or YouTube) when time permits
- Quarterly CTPM E-Tech articles relating to the latest developments or learning regarding a specific topic or theme of Continuous Improvement identified by our members
- Immediate Access to 'Members Only' section of our website for:
  - Past Webinar slide presentations
  - Past E-News and E-Tech articles
  - Papers and Articles relating to Continuous Improvement and TPM & Lean
  - Past Annual Forum presentations

**Providing Exclusive Access to 3 Key Enablers of Successful CI Capability**

- Eligibility to enrol in our internationally recognised CI Leadership / Instructor's Program and upon graduation have access to purchase, as required, any of CTPM's extensive range of Continuous Improvement Support Material including Team Member Manuals and Workbooks
- Eligibility to apply for the 5 Level Milestone CI Excellence Award to support your Continuous Improvement journey to Operations Excellence
- Eligibility to enter your CI teams in our Aussie Cup Team Competitions where the top teams are selected to present at CTPM's Annual Forum (CI in Action) for final adjudication

**APPLICATION FOR CTPM COMPANY MEMBERSHIP**

Company:	Site / Department:
Address:	
Phone:	Fax:
Main Contact:	Position:
Email:	

☐ EFT - Westpac - BSB 032 695 - Account Number 120 426

☐ Cheque enclosed, payable to: **CTPM Australia**


☐ INVOICE MY COMPANY ON PURCHASE ORDER No: \_\_\_\_\_

☐ Please charge my Credit Card \$ \_\_\_\_\_

☐ Visa   ☐ Mastercard   ☐ Bankcard

CVV: \_\_\_\_\_ CARDHOLDER'S NAME: \_\_\_\_\_

EXPIRY: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_



**Quick Online Application: [www.ctpm.org.au](http://www.ctpm.org.au)**

*Review past webinars on YouTube or via our webpage: [www.ctpm.org.au](http://www.ctpm.org.au)*

# How can we help you develop your in-house capability?

## OPERATIONS EXCELLENCE - PEOPLE BEFORE TOOLS

1-day Interactive Workshop

### Do you need to:

- Purchase new equipment for your workplace in the not so distant future?
- Establish a standard approach to introducing new equipment to your site?
- Understand how to get the most value from your supplier to ensure user friendly equipment?



### By the end of this workshop you will learn:

- The Importance of the 5 stages of New Equipment Management
- How to build key relationships between the key players in the new equipment process
- How to make your new equipment User Friendly for all your site personnel

## GET NEW EQUIPMENT RIGHT THE FIRST TIME

Ensuring new equipment is User Friendly for Operators and Maintainers

- Use Operability, Maintainability and Trainability rather than just Functionality for designing or buying new equipment
- Develop checklists to ensure all issues are covered
- Ensure Factory Acceptance Testing is done by the right people



This 1-day Workshop will assist you to understand the differences and benefits of taking a new approach to introducing new equipment to your workplace.

It also provides the tools and framework to ensure new equipment is user friendly and performs to expectation.

Next Public Workshop:  
**Sydney NSW - 8 May 2015**

Venue: TBA

For Host or In-house workshops contact CTPM  
Head Office on +61 2 4226 6184 or  
visit [www.ctpm.org.au](http://www.ctpm.org.au)

This outstanding workshop is designed for all Production, Maintenance, Quality and Improvement personnel interested in implementing new equipment to support Operations Excellence



## OPERATIONS EXCELLENCE - PEOPLE BEFORE TOOLS

2-day Interactive Workshop

### Do you need to:

- Stop your Improvement Initiatives stalling or taking too long?
- Remove road blocks to achieving excellence?
- Develop your Frontline Leaders so everyone else in the Leadership Chain is not managing down a level?



### By the end of this workshop you will learn:

- How to engage your people and achieve significant sustained improvement
- A means to integrate your existing improvement activities into a proven pathway that ensures sustained results
- What differentiates the best from the average and hear:
- Case Studies from sites that have made significant progress in their transformation to Operations Excellence

## GETTING TPM & LEAN / CI TO SUSTAIN

- Engage your people while applying the latest learning in achieving Operations Excellence
- Develop a framework that integrates your current improvement activities (eg Lean, TPM, CI, 6σ etc)
- Learn how best to maximise safety, quality and productivity while minimising costs, and getting the most from your people, equipment & processes



This 2-day Workshop is based on over 20 years of hands-on refinement which will take the mystery out of integrating all the Continuous Improvement principles, tools, and concepts.

It will cut through all the confusion and provide a comprehensive strategic pathway to sustain Operations Excellence in an Australasian workplace environment.

Next Public Workshop:  
**Sydney NSW - 5 & 6 May 2015**

Venue: TBA

For Host or In-house workshops contact CTPM  
Head Office on +61 2 4226 6184 or  
visit [www.ctpm.org.au](http://www.ctpm.org.au)

This outstanding workshop is designed for anyone who is interested in sustaining Operations Excellence at their site through on-going Continuous Improvement - Bring all your key people







# Question Time



Presentation by:  
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