

Advanced Equipment Maintenance Management Best Practices

Shanghai, China

12th&13th December 2011



Trainer:

Bin Li

He had been senior production executives, production centre part-time trainer, core team member of TPM activities and internal trainer in a well-known multinational company. In early 2000, changed from production management to specialize in providing education and training to production operations related staff, the main job was to provide training to nationwide sub-companies, the core suppliers and other related enterprises; after that he worked as part-time trainer, training consultant in School of Management of a domestic enterprise. From July 2002, he worked as a professional trainer, cooperated with a number of management consultant companies engaged in management training nationwide, including internal training and public courses. As a project manager and core members, he worked with other project team members co-counselling enterprises including machinery, beer industries, etc., in which the TPM activities for a well-known enterprises in Tianjin achieved remarkable results: the downtime rate of the demonstration equipments reduced and stabilized at 1/20 of the original level, with an average increase of nearly 12% in production capacity and average savings of more than 1 million per month. Other production lines' efficiency had also been improved, the demonstrated production line's OEE increased by nearly 15%. Mr. Li advocate training concept of "happy to learn and enjoy work", pursue of practical learning concepts of "learner-centred, easily understood, can remember, usable". Since engaged in professional training, more than 13,000 students attended his public courses, some typical clients include Bohai Shipyard of PetroChina, Dalian ITT Flygt Pump, ABB Shanghai, LG Chemical, LG Tongchuang, SGNEC, Tianjin Denso air-conditioning, Hisense mobile phone, Uni-President Enterprises Corp., SMC (China), Lenovo Computer, Gates Unitta, Chery Auto, Samsung, Siemens, Pepsi-Cola China, SONY Chemical, Timken, Sun Machinery, Liufeng Machinery, Sumitomo Electric, Flextronics, Suzhou Metrologic, Huiyuan Juice, Red Bull drinks, Qingdao Beer, 999 medicine, Lanbao pharmaceuticals, Shanghai Yongda elevator, Japanese state printing, Panasonic Communications, Daewoo Heavy Industries, Huaqiang Sanyo Dalian, Shenyang Astron chemical, Howden Weihai, etc.; Up to now has completed more than 230 in-house trainings for companies such as: Sany Heavy Industry, Shanghai Maglev, Dongfeng Honda Engine (Guangzhou), Dongfeng Honda Automobile Parts (Huiyang), Yutong Bus (Luoyang plant), Shandong aluminum plant of CHINALCO, Shanxi Aluminum Plant, anjiangkou aluminum of Hanjiang Group, Tradex Converting Co., Ltd., Wuxi Lihu Impeller, Asiatrak Tianjin, Qinquangdao Dicastal Wheel, Yantai Timken, Yuasa Battery (YUASA), Punch Industry (Dalian), Philips Lighting, Makita China (Kunshan), Tianwei Baobian Group (Baoding), Tianjin Tianhai synchronizer, Suzhou Grande Electronics, hina-Arab fertilizer, Weishen pharmaceuticals of CSPC, Zhongnuo pharmaceutical, Taishan beer, Swire Coca-Cola, Perfect China, Nanjing Phoenix Contact, Guangzhou Pusheng Speakers, Guangdong Jinsha Paints, Sate-Lite Foshan) Plastics, ECCO (Xiamen), Quanzhou Xinhuanghe Clothing etc.

Who Should Attend?

Production / manufacturing manager, equipment manager, equipment maintenance and repair engineers, maintenance personnel, production supervisors

Training Features:

- Learner-centred, pay attention to the participation of trainees;
- Combine practical case studies and well-designed games, advocate discovery learning;
- Good at interpretation of the complex and boring content simple and vivid.

In-House Training Solutions

If you have a number of delegates with similar training needs, then you may wish to consider having an In-House Training solution delivered locally on-site. Course can be tailored to specific requirements.

Please contact **Whitney Shen** on **+86 28 8532 7678** or email **whitney.shen@martinlinking.net** to discuss further possibilities.

Pre-Course Questionnaire

In order to tailor this course precisely to your needs, the course leaders would value information on your knowledge, experience and requirements.

Training Outline (2 days):

Section 1. Equipment maintenance management basics

(about 2 hours)

1. New ideas of Maintenance and management - From production maintenance to full participation of Preventive Maintenance

2. Equipment wears theory and OEE

3. Maintenance goals (three zero concept)

4. TPM concept and total plant management

5. Datamation and quantitative analysis

MTTR, MTBF calculation and analysis

Overall Equipment Efficiency (OEE) calculation and analysis

- ✓ Real significance of OEE and its financial results
- ✓ Understand three components of OEE: Availability, Capability, Quality
- ✓ OEE calculation factors and Case Analysis
- ✓ Skills to identify device loss using OEE
- ✓ OEE and TEEP (Total Effective Equipment Productivity)
- ✓ OEE \ TEEP and Overall Asset Effectiveness

Case study and discussion

Misconceptions about OEE and case study

Analysis and discussion: practical data analysis and review

Section 2. Equipment maintenance strategy (about 3 hours)

1. Equipment maintenance strategies and considerations

Analysis and discussion on maintenance strategy

Fundamental basis for determining maintenance strategy - number of devices and ease of maintenance

Maintenance time strategy

Cost factors must be considered

Equipment maintenance outsourcing strategy

Practical discussion

Workshop Schedule Day One & Two

0830 Registration and Coffee

0900 Workshop Commences

1045 Morning Refreshments

1115 Workshop Re-commences

1200 Luncheon

1300 Workshop Commences

1500 Afternoon Refreshments

1530 Workshop Re-commences

1730 Workshop Concludes

2. Framework and content for effective equipment maintenance management

Equipment point inspection system set up and practice

Establish and improve equipment maintenance system (PM, CM, BM)

Understanding equipment failure bathtub curve

Proper handling relationship between routine maintenance and professional maintenance

Basic concept system for professional maintenance

Basic concept of zero-fault equipment

3. Preventive maintenance management concepts based on Point Inspection

Five basic elements of Point Inspection - standards, plans, routes, implementation methods, performance evaluation

Structure and classification of Point Inspection management

Establishment of Point Inspection standards and four systems standards

Point Inspection path optimization

Case: standardization work of full-time Point Inspection staff

Standardization of equipment Point Inspection

Point Inspection and scheduled maintenance

Competency requirements and training of various types of Point Inspection staffs

Case: million points of equipment point inspection engineering of Wuhan Iron and Steel Group

Practical discussion

About Martin Linking

Martin Linking Business Consulting plans to produce more than 80 trainings and conferences and works with senior executives from the majority of the world's top 1000 companies to improve their business strategy and match their learning and training needs in one year. And we continue to grow.

We also invite the leading business practitioners, industry decision makers and innovators to share insights, best business practice, and new technology at our forums. **We are dedicated to give attendees cutting edge information they can use immediately.** We constantly research and listen to all industry sectors to ensure that the business intelligence we provide is timely and cutting-edge.

Section 3. Equipment maintenance management operation practices (about 6 hours)

1. Equipment operator's Autonomous Maintenance operation practices (2 hours)

Equipment Point Inspection system and Preventive Maintenance
 Basic Point Inspection and maintenance of equipments by production operators
 Function of equipment producer for equipment zero failure
 Meaning of on-site Autonomous Maintenance and improvement activities
 Three basic requirements for good operator
 Steps and practical points to practice Autonomous Maintenance
 Case and discussion:
 How to make operators really implement Autonomous Maintenance in work? The difficulties, confusion and solutions
 Discussion of different ways of Point Inspection in practice

2. Equipment maintenance and management operation practices (3 hours)

(1) Focus on the improvement of key equipments
 Several considerations to identify key equipments
 Dynamic management of key equipments and refinement practice
 Discussion: How to determine your key equipments
 (2) Maintenance management with zero failures as the basic goal
 Equipment forced deterioration and natural deterioration analysis
 Approaches to pursue equipment zero-failure
 Statistics and analysis of fault data
 Equipment failure analysis and countermeasures
 Professional temporary maintenance reference book (for professional sector)
 Point Inspection form for routine maintenance
 Case Study
 Condition-based Maintenance (CBM) based on equipment diagnostic techniques
 About diagnostic equipments
 Panel discussion to share practice

(3) Equipment daily maintenance history data and maintenance costs management (content, methods)
 Establishment and optimization of equipment maintenance history data
 Failure statistics and analysis
 Equipment failure card and fault code
 Common failure modes of rotating equipments
 Common failure modes of stationary equipments
 Maintenance and management cost analysis
 Three basic questions about cost - structure, proportion and total sum
 Case Study
 Early development and Maintenance Prevention of equipments
 Early planning of equipments and LCC (Life Cycle Cost) management

3. Analysis and management of spare maintenance parts (1 hour)

Use actual consumption as the basis for statistical analysis
 ABC analysis and optimization of spare parts
 Inventory control of spare parts and maintenance timeliness
 Different parts have different procurement strategies
 Procurement of spare parts and cooperation with equipment department
 Case Study
 Discussion: practical issues of spare parts management

Section 4. Maintenance Training (about 1 hour)

Planning maintenance training materials
 Maintenance staff training - multi-skilled training methods and mechanisms
 Operator training - zero error operation and Autonomous Maintenance
 Using OPL (One Point Lesson) to train
 Maintenance and repair efficiency performance appraisal: MTTR and repair efficiency
 Video study and case analysis

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高级设备维修管理最佳实践

上海，中国

2011年12月12日至13日



培训师:

李斌

曾经担任著名跨国企业高级生产主管，生产中心兼职培训师，TPM 活动小组核心成员，内部培训师。2000年初，从生产管理转向专门对生产运作相关员工进行教育训练，主要工作是在全国范围内相关兄弟公司、核心供应商及其他关联企业实施培训；后在国内企业管理学院担任兼职培训师、培训顾问。

2002年7月始作为职业培训师，与多家管理顾问公司合作，全国范围内从事管理培训工作，包括内部培训和公开课培训。作为项目经理和核心成员，与项目组成员共同辅导的企业包括机械、啤酒等，其中天津某著名企业的 TPM 活动，取得显著效果：示范设备故障停机率降低并稳定在原来的 1/20，平均产能提升接近 12%，月平均节约 100 多万元，其他生产线效率也得到改善，示范生产线的 OEE 水平提高近 15%。

李老师倡导“快乐学习、享受工作”的培训理念，追求“以学员为中心、听得懂、记得住、用得上”的实用学习理念。从事职业培训以来，公开课学员累计已超过 13000 人，部分代表性客户如中石油渤海修船厂、大连 ITT 飞力泵业、上海 ABB、LG 化学、LG 同创、北京首钢日电、天津电装空调、海信手机、统一工业、SMC（中国）、联想电脑、盖茨优霓塔、奇瑞汽车、三星电子、西门子、百事可乐中国、索尼凯美高、铁姆肯、太阳机械、六丰机械、住友电工、伟创力电子、苏州码捷、汇源果汁、红牛饮料、青岛啤酒、三九药业、蓝宝制药、上海永大电梯、日邦印刷、松下通信、大宇重工、大连华强三洋、沈阳阿斯创化工、威海豪顿华工程等；截止目前入厂内部培训企业已完成 230 多家，服务的部分代表性客户如：三一重工、上海磁悬浮、东风本田发动机（广州）、东风本田汽车零部件（惠阳）、宇通客车（洛阳工厂）、中国铝业集团山东铝厂、山西铝厂、汉江集团丹江口铝业、特瑞胶黏配件有限公司、无锡蠡湖叶轮制造、亚实履带天津公司、秦皇岛戴卡轮毂、烟台铁姆肯、汤浅蓄电池（YUASA）、大连盘起工业、飞利浦照明、牧田中国（昆山）、天威保变集团（保定）、天津天海同步器、苏州群鑫电子、中国-阿拉伯化肥、石药集团维生制药、中诺制药、泰山啤酒、太古可口可乐、完美中国、南京菲尼克斯电气、广州普笙音箱、广东鲸鲨制漆、顺德赛特莱特塑胶制品、厦门 ECCO（丹麦）鞋业、泉州新黄河服装等。

培训对象:

制造企业生产/制造部经理、设备部经理，设备保养及维修工程师、维修人员、生产主管参加；

培训特点:

- 以学员为中心，注重学员的参与；
- 实务案例分析与精心设计的游戏相结合，倡导启发式学习；
- 培训中听得懂、培训后记得住，这样才能学得会——擅长把枯燥复杂演绎得生动简单。

内训方案

如果公司有许多人有类似的培训需要，那么你不妨考虑内部培训的解决方案。培训将在贵公司现场举行。并且培训可以根据您具体的要求来进行。

请联系 **Whitney Shen** 来讨论合作的可能：

电话：**+86 28 8532 7678**

电邮：**whitney.shen@martinlinking.net**

课前问卷调查

为了使这一课程真正适合您的需求，培训师将会评估你现有的知识，经验和需求。

高级设备维修管理最佳实践

培训大纲（2天）：

单元一、设备维修管理基础（约2小时）

1、维修管理新理念—从生产性维修到全员参加的预防性维修

- 2、设备磨损原理及 OEE
- 3、维修的目标(三个零的概念)
- 4、TPM 理念与全员工厂管理
- 5、数据化及其量化分析

MTRR、MTBF 计算与分析

设备综合效率 OEE 计算与分析

✓OEE 的实质意义及其财务效果

✓认识 OEE 的三个构成因素：时间利用率

（Availability），性能利用率（Capability），良品率（Quality）

✓OEE 计算要素与实例分析

✓如何利用 OEE 识别设备损失（LOSS）的技巧

✓OEE 与 TEEP（Total Effective Equipment Productivity）

✓OEE\TEEP 与总体资产利用率（Overall Asset Effectiveness）

案例学习与讨论

关于 OEE 的误区与案例分析

分析与讨论：实务数据分析与检讨

单元二、设备维修策略（约3小时）

1、设备维修策略及考虑因素

关于维修策略分析与探讨

确定维修策略的基本依据-设备数量与维修难易度

维修的时间策略

必须考虑成本因素

设备维修的委外策略

实务讨论

培训时间表——第一天和第二天

0830 签到及早茶

0900 培训开始

1045 上午休息

1115 培训继续

1200 午餐

1300 培训开始

1500 下午休息

1530 培训继续

1730 培训总结

2、设备维修管理有效运作的框架与内容

设备点检体系的建立与实践

建立健全设备保养体系（PM、CM、BM）

设备故障的浴缸曲线再认识

正确处理设备专业保养与日常保全的关联

专业保养的基本观念体系

设备零故障的基本观念

3、以点检为基础的预防维修管理理念

点检的五个基本要素—标准、计划、路线、实施方法、绩效考核

点检管理的架构与分类

点检标准的确立及体系四大标准

点检线路优化

案例：专职点检员的标准化作业

规范化的设备点检工作法

点检与定修

各类点检人员能力要求与培养

案例：武钢集团的万点设备点检工程

实务讨论

关于马汀令可

马汀令可商务咨询计划每年组织超过80场的培训和会议，与全球1000强公司的高层经理一起提高他们的商务战略，满足他们的学习和培训需求。并且我们在不断成长。

我们邀请领先企业的管理者，决策者和创新者在我们的活动中分享他们的思想观念，最佳商业实践和新技术。我们致力于为我们的客户提供即刻可用的前沿信息。我们不断地研究和聆听所有行业的声音来保证我们提供商业信息的及时性和前沿性。

高级设备维修管理最佳实践

单元三、设备维修管理操作实务（约 6 小时）

1、设备操作者的自主维修操作实务（2 小时）

设备点检制与预防性维修

生产操作者对设备的基础性点检与保养

生产单位对于设备零故障的作用

现场自主保全、改善活动意义

优秀操作工的三点基本要求

实践自主保全的步骤和实践要点

案例与讨论：

实务工作中如何使操作工能够真正落实自主保全活动？其

中的难点、困惑与解决思路

实务中不同的点检实践方式讨论

2、设备维修管理操作实务（3 小时）

（1）关注关键设备的改善

确定关键设备的几个考虑因素

关键设备的动态管理与精细化实践

讨论：如何确定你的关键设备

（2）以零故障为基本目标的维修管理

设备的强制劣化与自然劣化分析

追求设备的零故障方法展开

故障数据的统计和分析

设备故障原因分析与对策

专业保养临时基准书（专业部门用）

日常保养点检表格表单

实例分析

基于设备诊断技术的状态维修（CBM）

诊断仪器设备简介

实务问题小组讨论分享

（3）设备日常维修履历资料与保养费用管理（内容、方法）

设备维修履历资料的建立和优化

故障统计与分析

设备记录故障卡与故障代码

旋转设备常见的故障模式

静止设备常见的故障模式

保养费用分析与管理

关于费用的三个基本问题—结构、比例和总额

案例分析

围绕设备的早期开发与流动期管理（Maintenance Prevention）

设备的早期规划和 LCC（Life Cycle Cost）管理

3、维修备件分析与管理（1 小时）

以实际消耗量为统计分析基础

备件的 ABC 分析及其优化

维修备件的库存控制与维修及时性

不同备件适用不同的采购策略

备件采购与设备部门的合作

实例分析

讨论：关于备件管理的实务问题

单元四、保养教育训练（约 1 小时）

规划保养训练教材

维修人员培养--多技能训练方法与机制

操作人员训练—零错误操作与自主保养

利用 OPL（One Point Lesson）进行训练

维修绩效考核 MTTR 及维修效率

录像学习与实例分析

内训方案

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高级设备维修管理最佳实践

SH20111212-Sales Contract-Please Complete in Capital Letters and Black Ink

Sales Contract

Please complete this form immediately and fax back to

Whitney Shen

Fax: +86 28 8532 6768

Fee Per Delegate

Two Day Training Fee RMB 5995 per person

All the registered delegates are entitled for a set of documentation free of charge

DOCUMENTATION RMB 500

If you are unable to attend the conference/training but wish to receive copies of the conference/training documentation, please complete the sales contract, tick this box and return the contract with payment details.

Full Payment is required within 5 working days

Name: _____

Position: _____

Email: _____

Name: _____

Position: _____

Email: _____

Name: _____

Position: _____

Email: _____

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Address: _____

Town: _____ State: _____ Postcode: _____

Tel: _____ Fax: _____

Nature of Business: _____

Company Size: 1-99 100-249 250-499

500-999 1000+

Authorization

(Signatory must be authorized to sign on behalf of contracting organization.)

Name: _____

Position: _____

Signature: _____ Date: _____

This booking is invalid without a signature.



Register Now

Contact: Whitney Shen

Tel: +86 28 8532 7678

Fax: +86 28 8532 6768

Email: whitney.shen@martinlinking.net

Business Opportunities

An exhibition space is available at the conference. Sponsorship opportunities covering lunch, evening receptions and advertising in documentation packs are also available. Please contact Ms. Whitney Shen at +86 28 8532 7678.

Payment Method

Our payment terms are 5 working days on receipt of invoice and full payments can be made by bank transfer.

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CONFIRMATION DETAILS: After receiving payment, a receipt will be issued. If you do not receive a letter outlining the conference details two weeks prior to the event, please contact the Conference Coordinator at Martin Linking.

Terms & Conditions:

1. Fees are inclusive of program materials and refreshments.
2. Payment Terms - Following completion and return of the registration form, full payment is required within five (5) working days upon the issuance of invoice. Payment must be received prior to the conference/training date. A receipt will be issued on payment. Due to limited conference/training seats, we advise early registration to avoid disappointment. We reserve the right to refuse admission if payment is not received on time.
3. Client's Cancellation/substitution - Provided the total fee has been paid, client's cancellation must be received in writing by MAIL or FAX four (4) weeks prior to the event in order to obtain an 85% credit to attend for any future **Martin Linking** Events. Under such circumstances, **Martin Linking** will retain the other 15% service fee to cover expenses for prior cost that has already been incurred upon the acceptance of registration. All bookings carry a 50% cancellation liability immediately after a signed sales contract has been received by **Martin Linking**.
4. If, for any unexpected circumstances or reasons that **Martin Linking** decides to postpone this event, the client hereby indemnifies and holds **Martin Linking** harmless from any cost incurred in by the client. The event fee will not be refunded, but can be credited to future **Martin Linking**' s events. **Martin Linking** reserves the right to change the content without notice.
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