

'TPM Green Belt':

A Comprehensive Development Program for Continuous Improvement Competencies of Engineers

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What is TPM?

Total Productive Maintenance



Main Philosophy:

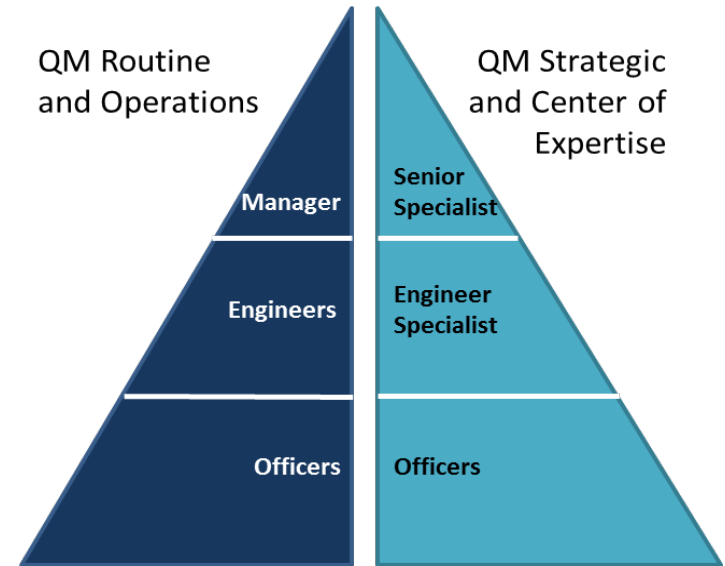
*“Equipment / machine has no life of its own. Its condition mirrors how we take care it. What we get is mostly what we put into it. Thus how equipment performs greatly enables its operators to realize how much he/she know about it. Thus **‘I run it, I fix it!’**”*

A Japanese way of management, based on TPS and TQM, promoted by the *Japan Institute of Plant Maintenance (JIPM)*

Promoting TPM at **Our Company**

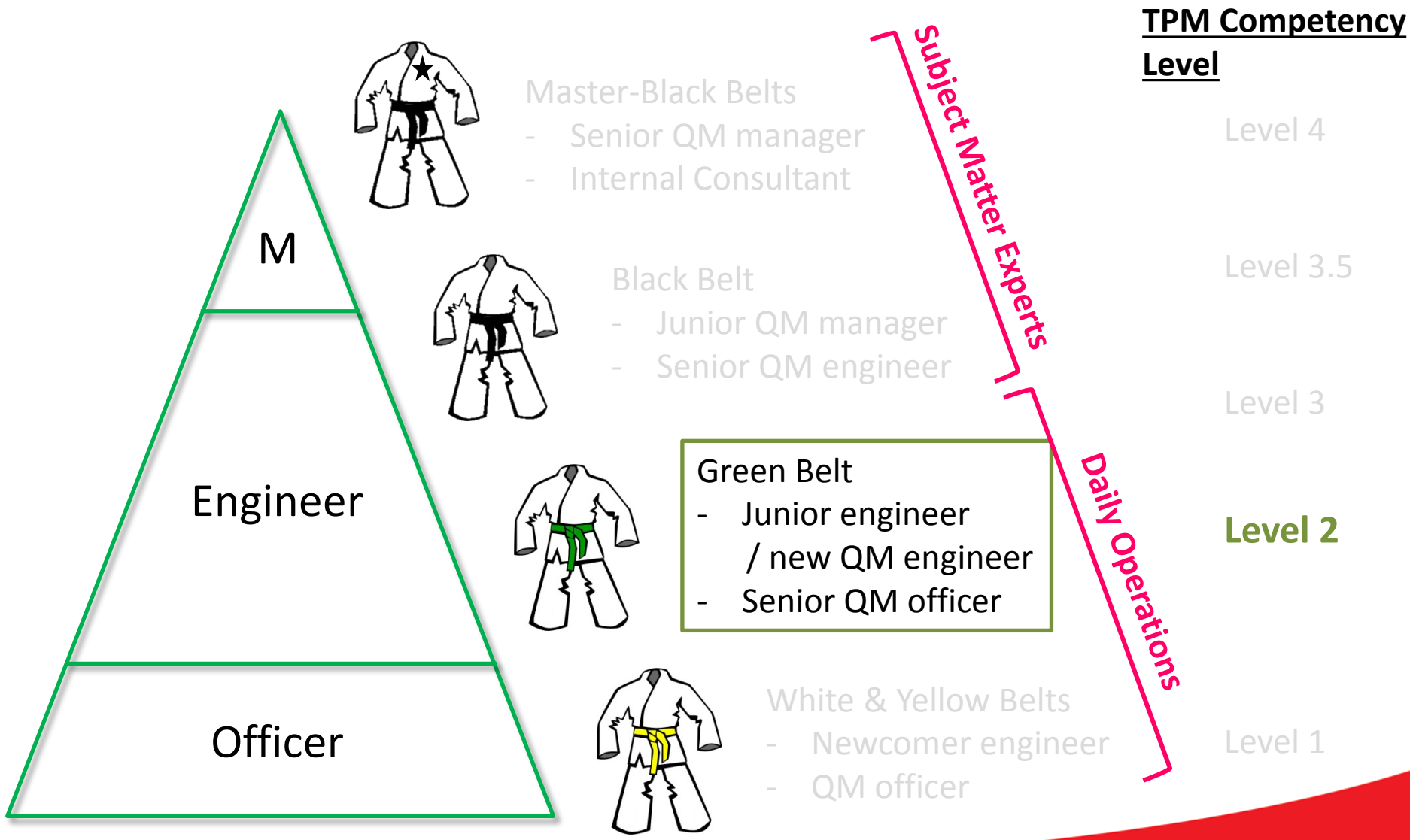


A group of **dedicated employees** – called **‘Quality Management,’** who have the following mission:

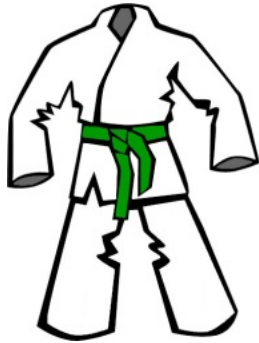


Provide professional, effective, and efficient consultation (i.e. including people development, advising, and coaching) for establishment (and integration), improvement and sustainability of the management system, aligning with business directions, and facilitate execution process to achieve business performance excellence and employee satisfaction.

QM People Structure and Capability - TPM



Development program begin with “Roles and Responsibilities”⁵



QM “Green Belt”

- Junior Engineering
- New QM Engineer
- Senior QM Officer

Roles and Responsibilities

- Support Black Belt QM (Junior QM Manager and Senior QM Engineer) to implement TPM
- **Counselling Supervisor/ Operators to implement TPM as a tool to increase efficiency of machine and reduce maintenance cost (60-70%)**
- Educate TPM Tool and Techniques for operator and/or shop floor people to enhance capability of people to take care machine
- Promote TPM Culture in workplace.

OBJECTIVE/ EXPECTED DELIVERABLES:

- Consultation Knowledge & Skills
- Technical Knowledge & Skills (TPM + Tools & Techniques)
- Cost Saving / Project Success

The Program **Main Features**

Program Features	How They Help Satisfying Objective and Desired Outcomes
1. Blended Learning Approach (70:20:10)	Effective way of learning and knowledge and skill development
2. Program Contents	Cover both technical (i.e. hard-side) and management (i.e. soft-side, change management and people management)
3. Individual Consulting Project Assignments	Real project practices and exercises for trial of the lesson learnt in class (i.e. hands-on experiences)
4. Coaching Approach	Enhance learning experience by closely following-up, monitoring, and reflection by SME as coach
5. Other Development Instruments I. Consultation Manual and Checklist II. Learner's Passport and Dialogue	A handy tool for learners, ready for use on-site - a reminder of minimum requirement to be a good internal consultant. A tool for reflection and dialogue between coach and learners
6. Evaluation and Certification Conditions	Ensuring achievement of knowledge level and certification conditions

1. Development Approach – Blended Learning ⁷

An effective way of learning and knowledge and skill development



Mgt. Endorsement



Soft-side Introduction



Classroom Training



In-class Workshop



Fun with Training Kits



On-site Consultation

“10”

“20”

“70”

2 Program Contents

TPM Topics	Duration		Learning Approaches											
			Classroom Lecture	Group Discussion	Case Study/ Workshop	Training Kits	Homework Assignments	Project Assignments	Experience Sharing	Meet the SME	Site-visit	Self-study		
History & Introduction to TPM implementation of 8 pillars	2	hrs	☺								☺			
TPM Part I, II, III	1	hrs	☺	☺							☺			
Ideas for chronic losses & ideas for zero B.A.D.	1	hrs	☺	☺	☺						☺			
TPM policy setting and deployment	1	hrs	☺	☺	☺						☺	☺		☺
Planning for TPM activities & promotions	1	hrs	☺	☺	☺						☺	☺		☺
EBITDA tree and company performance visual board	2	hrs	☺	☺							☺			
TPM activity report and presentation (for TPM Award assessment)	2	hrs	☺								☺			
(Autonomous Maintenance) Tags, Meeting, One-Point-Lesson, and Activity board	3	hrs	☺		☺	☺					☺		☺	
(Focused Improvement) Loss concepts & structures	3	hrs	☺	☺							☺			
(Focused Improvement) Ideas to improve efficiency	3	hrs	☺	☺	☺						☺			
(Quality Maintenance) Infinite loop approach	3	hrs	☺								☺			☺
(Planned Maintenance) Maintenance techniques and strategies	3	hrs	☺		☺						☺			☺
Other Pillars Mechanisms (Initial Phase Management, Supply Chain Management/ Administrative and Support Departments, Education and Training, Safety, Health, and Environment)	6	hrs	☺								☺			☺
TOTAL	31	hrs												

Improvement Tools and Techniques Topics	Duration		Learning Approaches											
			Classroom Lecture	Group Discussion	Case Study/ Workshop	Training Kits	Homework Assignments	Project Assignments	Experience Sharing	Meet the SME	Site-visit	Self-study		
7 QC Tools, Data Collection and Basic Minitab™	1	Day	☺											
QC Story Approach (Problem Solving and Task Achieving)	2	Days	☺								☺			
Introduction to Statistics for Engineers	3	Days	☺								☺			
P-M Analysis	1	Day	☺								☺			
Automation and Karakuri Kaizen	2	Days	☺			☺								☺
Special topic: Industrial Engineering/ LEAN Techniques	1	Day	☺											☺
Special topic: Roll-paper Analysis (Makigami)	1	Day	☺		☺									☺
Special topic: Material-Flow Cost Analysis	2	Days	☺		☺									☺
TOTAL	13	Days												

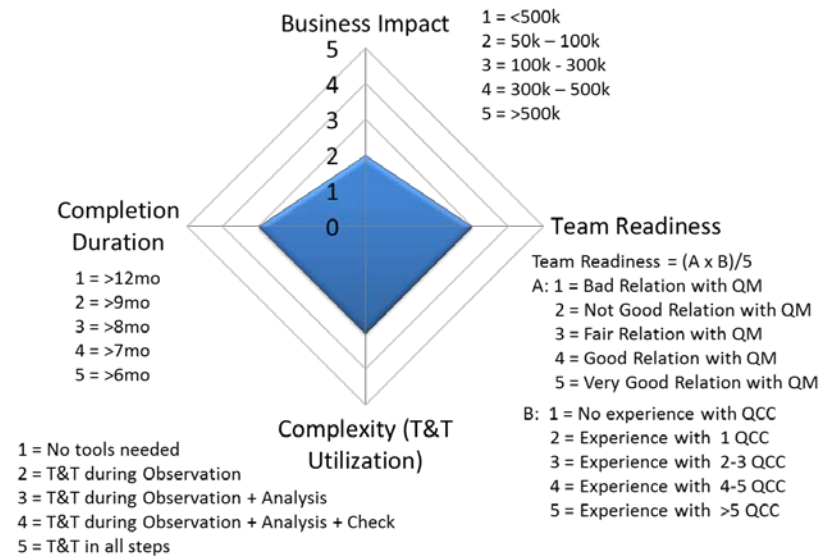


People Management Topics

- People Management Skills Topics
- People behavior style (DISC)
- Change management process
- How to deal with difficult situations
- Holistic thinking (Dot-to-Dot Literacy) and critical thinking
- Data collection (e.g. in-depth interview, facilitating skill) and data analysis
- Building rapport and relationships
- Questioning and active listening skills
- Effective communication
- Time management
- Coaching your clients

3. Individual Consulting Project Assignments

Real project practices and exercises for trial of the lesson learnt in class (i.e. hands-on experiences)



	Criteria	Objectives
<i>Difficulty Level</i>	<ul style="list-style-type: none"> It has to be a small group/ operator level. Have a certain complexity, so many opportunities to apply tools and techniques. Projects can be done within 6-8 months. 	<ul style="list-style-type: none"> To ensure that level of technical difficulty is not too high. To ensure that the learners have opportunities to try as many tools and techniques. To ensure that level of technical difficulty is not too high. To ensure that the learners can finish all the work within the development time-frame.
<i>Progress</i>	<ul style="list-style-type: none"> As of the beginning of the development program, progress of the project should not be later than observation stage. 	<ul style="list-style-type: none"> To provide a venue and practice opportunities of all stages in problem solving QC story.
<i>Readiness</i>	<ul style="list-style-type: none"> Have clear team member - roles & responsibilities, and readiness to work on a project (i.e. attitude towards work improvement and experience with CI projects.) Projects are approved by both Line Mgr. and QM Mgr. 	<ul style="list-style-type: none"> To minimize possible 'soft' issues (i.e. people difficulties) To minimize possible 'soft' issues (i.e. people difficulties)
<i>Impact</i>	<ul style="list-style-type: none"> Have major impact (i.e. savings, work environment improvement, etc.) as an improvement project. 	<ul style="list-style-type: none"> To deliver real improvement to the organization the same time as it is a practice job. To be a good success case in learners' portfolio

4. Coaching Approach



Enhancing learning experience by closely following-up, monitoring, and reflection by a Subject Matter Expert (SME) as a coach.

Coaching Approach	Coach's Responsibility	Learner's Responsibility
Shadowing	100%	0% (only observe to reflect)
Co-consultation	50%	50%
Learner-Lead	20%	80%
Coach Follow-up	5%	95%

5. Other Learning Instruments

Learning Passport & Dialogues



A handy tool for learners, ready for use on-site - a reminder of minimum requirement to be a good internal consultant.

Consultation Manual & Checklists

1. Introduction of the consultant, getting rapport, clear understanding, align goals and objectives
2. Initial data analysis, both technical and soft - change mgt. (incl. stake holder analysis)
3. Create assumption of causes and how to solve problems
4. Propose preliminary approaches & solutions to customers
5. Hands-on with customers to implement countermeasures, communicate to all stakeholders
6. Summarize and conclude, record lesson learnt

STEP	Internal Consultation Process	Checklists
1	แนะนำตัว, สร้างความเข้าใจ และปรับกรอบความคิด (Introduction of the consultant, getting rapport, clear understanding, align goals and objectives)	(1) Introduce your strength (2) Introduce your experience (3) Ask what is team's objectives (4) Ask what is team's expectations (e.g. resource aspects) (5) Explain your objectives (6) Explain
2	วิเคราะห์หรือสังเกตเบื้องต้น (Initial data analysis, both technical and soft - change mgt. (incl. stake holder analysis))	(3) Participate in data collection (if possible) (4) Go & See (Genba) (5) Study relevant theory/ principles available elsewhere (e.g. Google, or textbook) (6) Study relevant theory/ principles available elsewhere (e.g. Google, or textbook)
6	สรุปบทเรียน (Summarize and conclude, record lesson learnt)	(3) Identify future opportunities (4) Record best practices and lesson-learnt

6. Certification Criteria

Graduation Elements	Sub Score	Passing Score
Class Attendance & Participation	20	10
Homework Assignments	20	10
Paper Test (for some topics)	10	5
Consultation Project	50	25
<u>Total</u>	<u>100</u>	<u>75</u>



Conclusion and Learning



- ✓ Involvement, approval and contributions from **all stakeholders**
- ✓ The **70:20:10** learning approach
- ✓ **People Management Skills/ Soft-side** (i.e. mind-set and behaviors) issues
 - In selling the project to all key stakeholders
 - To be a change leader/ good consultant
- ✓ Learning from **what you already have** (or other readily available courses in the market)
- ✓ Aim at what we want **'to-be'** not what we are currently at (i.e. Design for the future)
- ✓ Other **complementary elements** should be developed together to support each other (e.g. employee's career path and career development, and linkages to company direction in medium-to-long term span)

Process Loss Success Case

Project : Product Giveaway at Packing Line #7



Project Leader
(Packing Line
Supervisor)

Green Belt Student
(Internal Consultant
for CI)

Chronic Problem

Avg. weight of Normal bag (25 kg.)
is high at **25.07 kg** (May 2015)

→ Result in Giveaway loss : 5.2 MB/year

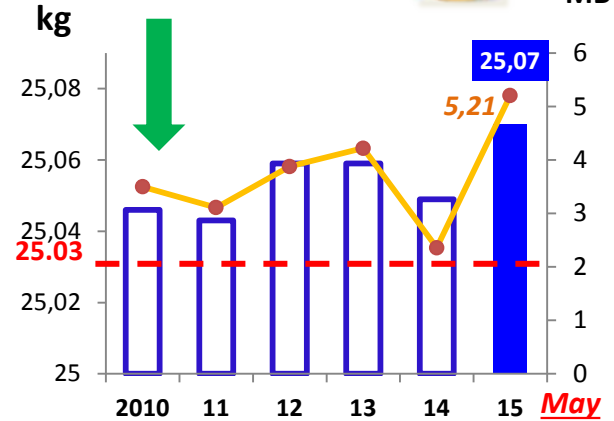
Root Cause

High Variation of
Weighing at Scale B

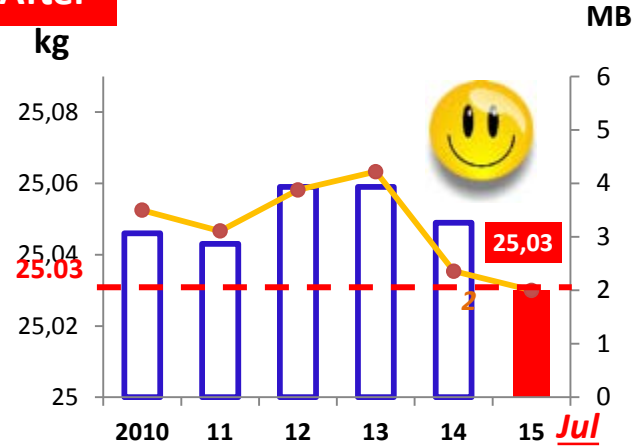
Target: Weighting SD
and Shift Mean →
25.03 kg



Before



After



TPM/ QC Story Green Belt Program

Experience Learning Approach 70:20:10

Technical (Hard) Skills and People Management (Soft) Skills

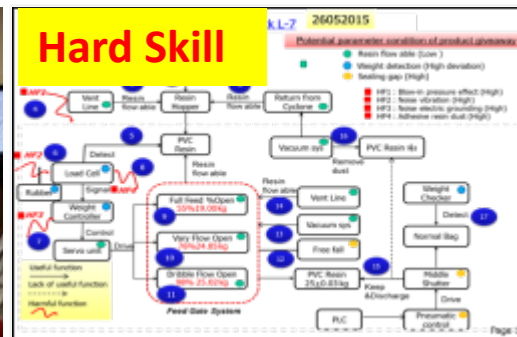
Restore the
source of
variation

Soft Skill



Stakeholders Analysis and
People Management

Hard Skill



Applying Tools & Techniques:
TRIZ + P-M Analysis



Results :

- ✓ Avg. Weight = 25.03 kg,
Saving USD 100,000/Year
- ✓ Expansion to other Auto
Packing Lines



For Your Attention

Questions?