

# **Total Productive Maintenance: what is it?**

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By Carlo Scodanibbio

Just consider this little story.

Coming back home from honeymoon, life suddenly lands into reality, for husband and wife.

And reality consists of a number of small and big things to do, like connecting and putting into operation the new washing machine and dishwasher, and the stove, and the microwave oven, and the fridge, and the vacuum-cleaner, and the food processor..... and this requires reading the instruction manual, checking water and electricity connections, understanding the operation procedures, and, eventually putting each appliance into operation. Whose task is it? Obviously husband's task, because "he is technically minded", as wife states very clearly. And so husband becomes all of a sudden a technician, an electrician, a plumber, and a domestic appliance technologist: he reads through 4 pounds of instruction manuals, gets organised with tools, does the job, and finally, once he has become a specialist in the field, he does a simple training course to wife on how to operate each machine and each appliance, on safety and other precautions to be observed, on little tricks and hints she must remember in order to make things work properly, and on basic maintenance rules.

On this very last point he finds a lot of resistance - wife is prepared to adhere to basic operating and safety procedures, but not very keen on carrying out certain maintenance tasks.....

Husband, very patient, and still in glorious love with wife, decides to compromise on this specific point, assigning to wife only some basic cleaning tasks, while he will take care of checking and cleaning regularly the washing machine filter, of replacing vacuum cleaner's bag when needed, of regular checking of fridge's evaporator, etc.

But this is not all: there are dozens of wall pictures to be hung - light fittings and bedside lamps to be connected - curtains to be fitted - shower to be adjusted - bathroom mirror to be fitted with bulbs - TV set and Video Recorder to be connected and programmed - honeymoon slides to be projected with the new slides projector (also to be put into operation) - and grandmother "holy" armchair to be moved to its final position in the lounge, just to mention a few other tasks for poor husband, who must literally split himself in two in order to cope with this considerable workload that adds to his professional work and keeps him busy evening after evening....

You may easily imagine the conclusion: in a matter of weeks, if not days, husband is silently appointed "house engineer and technician" and "house maintenance handyman", while wife has implicitly and explicitly self-appointed herself "chief domestic operator and principal chef-de-cuisine".....

As years go by, the two roles consolidate and become institutionalised.

The approach "....I operate, you repair...." or ".....I use, you maintain...." gets stronger and stronger. Wife is always primarily involved with direct and indirect domestic "operations": cooking, cleaning, ironing, etc., which she does herself, or by co-ordinating and supervising her maid.

Husband, who has in the meantime created a little workshop in the garage, equipped with all essential tools and well stocked with necessary spares and consumable materials (bulbs, fuses, tape, nails and screws, paints, etc.), is primarily involved with all basic maintenance activities (replacing bulbs, cleaning and checking, replacing gaskets to leaking water taps, painting, lubricating squeaky hinges..... and fixing, repairing, restoring, modifying, overhauling, tuning-up.....).

From time to time (but less and less frequently), however, they still look at their honeymoon slides, and think back to that glorious time.....

Amazing, isn't it? But very common, all over the world.

Most definitely, housewives capable of (and willing to) handling screwdriver and hammer, besides cooking spoon and sewing needle, are a minor percentage.

Where does this phenomenon originate from?

Where are the roots of this very diffused mentality?

When we consider that a similar, but much more serious phenomenon is happening from decades in industry, we can easily trace a common denominator.

In industry, the separation of roles between "Operations" and "Engineering/Maintenance" is an institutionalised feature from many decades. With very few exceptions, all over the world, industry is normally structured with a well distinct identification of two functions: the productive function (Operations), and the service, back-up technical function (Engineering and Maintenance).

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The scopes, the roles, the duties, the tasks and the responsibilities of the two functions are normally very well codified: the productive function takes care of producing products or services (manufactured goods, like in the manufacturing industry - objects of a project, like in the Construction or Project Industry - a service, like in Banks, or Insurance Companies, or Hospitals) - the back-up technical function takes care of making available, installing, keeping in good running order, and generally attending to the plant, the machines, the equipment, the installed services, etc. necessary to the productive function to perform its tasks. Plant include productive machines, fixed installations like electrical or air conditioning systems, or computer equipment.

The objectives of personnel belonging to the two functions are complementary but well distinct: productive personnel have the primary objective of producing products and or services - technical and maintenance personnel have the primary objective of assuring the availability of plant and equipment to be utilised by productive personnel.

This separation of roles has also originated and consolidated over many years a negative mentality, which can be summarised with the well diffused approach: "...I operate equipment, you maintain and repair it....", with consequences often catastrophic in industry: lack or absence of responsibilities, shifting of responsibilities (...passing the buck....), abuse and misuse of equipment and machinery, and, generally speaking, inefficiencies at various levels and of various entities.

Today we easily identify the roots of this mentality in the so called 1st Industrial Revolution, initiated by Adam Smith over two centuries ago with his principles of fragmentation of work and labour separation.

According to Smith's principles, work is much more efficient when fragmented into simple/elementary tasks to be performed by separate workers, each attending to a "piece" of the overall work, in which he can become "specialised".

Those principles have constructed industry as we know it: with functions, departments, separation of tasks, duties, roles and responsibilities.

Those principles have been applied very successfully also to the two industrial functions under consideration, i.e. the productive and maintenance functions, which have been structured accordingly, and perfected over the years as two well distinct entities.

These inherited principles form at the basis of separation of duties between husband and wife, like in our little story, and can be found still today in any human, organised activity: weather commercial (like in a hair stylist saloon), social (like in a Country Club), or in the public sector (like in a Post Office or Government Department).

These principles, well adequate for long time, and positive catalysts of the industrial revolution which we still see in our world, seem, however, no longer adequate for competing and succeeding in a fast changing world, well more complex than at those times in which industry was being born.

While many human activities and many industries are and will be organised, for years to come, still according to Smith's principles of work fragmentation and specialised tasks, many other are already changing and moving into the so called 2nd Industrial Revolution: several Manufacturing Industries (the so called "Lean Manufacturers"), like many World Class Performers in the Service Sector (Banks, Insurance Companies, Hotels and Restaurants Chains, Software Developers, to mention just a few), are moving away from Smith's principles, and now re-compose their previously fragmented productive processes assigning to multi-skilled personnel works featuring multi-tasks and multi-functions.

New challenges and new, comprehensive responsibilities are assigned to people, who now perform comprehensive chunks of work in team, having as primary objective not the task to be performed, but the result.

So, world is changing again, and in opposite direction to Smith's ideas.

Something of this nature is taking place, within World Class Industries, also in their productive and maintenance functions. The separation between the two functions, so sharp for many decades, now is being re-sewed. The old approach "...I operate, you maintain and repair...." is being shifted into a new, comprehensive approach: "We are all responsible for our equipment and for the value it generates".

This implies, firstly, a very new vision of the two functions production and maintenance. They are now seen as integrated, interconnected, re-united by the common goal. Personnel from the productive department now have much wider, multi-skill tasks: they not only operate machines, but also attend to several basic maintenance duties, like cleaning, lubricating and bolting, previously assigned to maintenance personnel.

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Properly trained, and by attending to these maintenance tasks, machine operators become more acquainted with their machines.

They know more about them, they understand better their principles of operation, and, most of all, they become like "human sensors" capable of detecting even fine signals of abnormalities in their machines, thus contributing to preventing their deterioration by reporting well timely on their status.

Besides, being knowledgeable about their machines, operators may contribute substantially to the solution of many productivity and quality problems originated by machines, and even to simple modifications to machines to upgrade their performance.

On the other hand, maintenance personnel, have now the primary role of making machine operators acquainted with machines by training them, and the essential role of co-operating close-by with the production personnel for enhancing the effectiveness of traditional maintenance activities and new ones as well (like Predictive Maintenance, Maintainability Improvement, and Maintenance Prevention).

The overall result is well described by the name of the discipline which takes care of the 2<sup>nd</sup> Industrial Revolution applied to Plant Management and Maintenance: its name is **Total Productive Maintenance** (or TPM, in short) - where the adjective Total signifies the two concepts of Overall Responsibility for Plant and Machines and Overall Effectiveness of Plant and Machines:

the first achieved through intensive and new-deal co-operation between the two functions, production and maintenance; and the second achieved through the joint efforts of the two functions.

- TPM is concerned with very high levels of performance of Plant, Machines, Equipment and, generally speaking, Technology
- TPM is concerned with very high levels of safety related to Plant
- TPM is concerned with new levels of performance of "People next to Machine", by assigning them new, wider and challenging tasks, roles and responsibilities, but also granting them higher possibilities of job satisfaction.

Like to say, according to TPM principles, that our housewife should be closer to her machines, more knowledgeable about them, capable not only of operating them, but also of attending to various maintenance tasks, and capable as well of detecting early signals of deterioration and wear, in time, before the matter becomes too serious..... and capable as well (and proud of) lubricating squeaky hinges and fixing leaking taps.

Dream or reality? The Total Productive Maintenance discipline is expanding very rapidly, world-wide. Will also housewives be affected by it?

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Carlo Scodanibbio, born in Macerata (Italy) in 1944, holds an Italian doctor degree in Electrical Engineering (Politecnico di Milano - 1970).

He has over 38 years of experience in Plant Engineering, Project Engineering and Project Management, as well as Industrial Engineering and Operations Management.

Free-lance Consultant since 1979, he has worked in a wide spectrum of companies and industries in many countries (Southern Africa - Italy - Cape Verde - Romania - Malta - Cyprus - Lebanon - Mauritius - Malaysia - Kenya - India - Saudi Arabia), and operates as an Independent Professional Consultant and Human Resources Trainer to industry.

His area of intervention is: World Class Performance for Small and Medium Enterprises in the Project, Manufacturing, and Service sectors.

His favourite area of action is: the "lean" area.

He has co-operated, inter-alia, with the Cyprus Chamber of Commerce, the Cyprus Productivity Centre, the Malta Federation of Industry, the Mauritius Employers' Federation, the Romanian Paper Industry Association, the United Nations Industrial Development Organisation and the University of Cape Town.

His courses and seminars, conducted in English, Italian and French, have been attended by well over 13.000 Entrepreneurs, Managers, Supervisors and Workers. They feature a very high level of interaction, and are rich in simulations, exercising and real case studies. The approach is invariably "hands-on" and addressed to immediate, practical application.

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