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TPM is 10% Of World Class Reliability, What Of The Other 90%?

Abstract: TPM is a production machinery uptime strategy, but used alone it does not bring world class reliability. Organizations running a TPM initiative without it being part of a lifecycle asset reliability creation strategy will still have high maintenance costs, regular arguments between production and maintenance, fall well short of the best uptime possible, and see TPM fail in future.

Keywords: Total Productive Maintenance, TPM, life cycle asset reliability

How many equipment operators does it take to change a light bulb in the equipment they operate? None—it's a job that an operator cannot do. Electrical circuitry is the domain of a licensed electrician. How many operators does it take to repair a hydraulic pump? None—it's a job they cannot do with certainty of success. How many operators does it take to change a spherical roller bearing on a 50mm shaft? None—they cannot be relied on to do the job right.

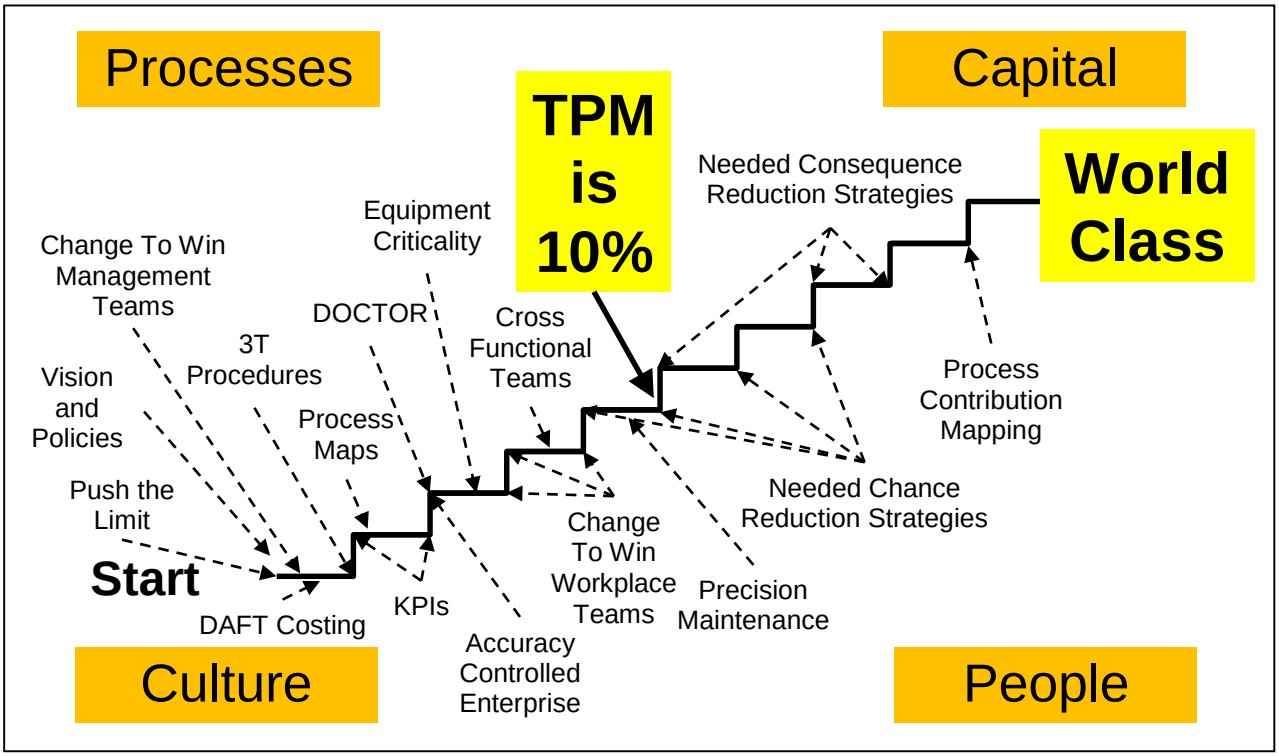

Figure 1 – Steps on the Path to World Class Performance

Your TPM success has limits equal to the technical skills and engineering knowledge of the operators that maintain the equipment. If you take on Total Productive Maintenance as your strategy to get operator involvement in the care and well-being of your plant, equipment and machinery be very careful what work you give them to do in your machines. Operators are never going to be equal to qualified, competent and experienced maintenance technicians.

Also known as Operator Driven Reliability, TPM gets limited success if it is a standalone program to reduce equipment downtime. Equipment failure causes and poor equipment reliability are mostly from choices and events that occurred well before the equipment went into operation. Simply getting operators to do basic equipment maintenance does not stop the past problems returning.

TPM requires that you stop the equipment at prescribed times to intentionally do preventive maintenance. Reliability creation is the opposite, whereby you do not need to stop the equipment

to do maintenance because no maintenance is required. Even if your company uses TPM properly and your operators do the PM tasks brilliantly, you're only 10% of the way up the climb to world class reliability.

1. TPM is a good concept to use, but it is a partial solution to poor reliability and not a complete maintenance and reliability solution.

2. A true and complete Plant Maintenance and Reliability Excellence strategy covers and addresses all the issues across the entire life cycle of your company's equipment. It includes business strategic matters and long term factors that are vital to do for production success, which TPM does not address.

3. Life cycle long, holistic Plant Maintenance and Reliability Excellence strategy will include TPM, but also changes your organization's business-wide systems and processes to build sustained world class reliability that continues over all the years the company is in business.

4. TPM used alone is unable to develop into a total, corporate-wide solution that you get from a Plant Maintenance and Reliability Excellence strategy. There are far more effective solutions for lowering production costs and lifting production throughput than using TPM alone.

5. Companies that first adopt a Plant Maintenance and Reliability Excellence policy will provide new tools and methods in their organization to investigate the best choices to make for rapid increase in reliability and reduction in maintenance costs and execution time. TPM may become part of the final solution, but it also may be overshadowed with even better options to lift plant uptime and equipment reliability.

6. TPM forms about 10% of what must be done to get highly effective, world class reliable operations. The remaining 90% of the life cycle actions needed for operational excellence success are not covered by TPM but are instead driven from a Plant Maintenance and Reliability Excellence philosophy.

So what can operators do if you chose to have a TPM program? First, and the most important of all, operator must be taught how to run their machinery perfectly, and how to run their production processes perfectly. If you can achieve that then your operators will make their greatest contribution to the future success and ongoing viability of the organization.

Once operators know how to always get their production plant and equipment running on their "sweet spots" they can then be taught the exact, correct way to do the minor maintenance of major assemblies, sub-assemblies and working components in their machinery. Be exact in the training of operators who do maintenance tasks. Their first learning of the maintenance tasks they will perform is by "monkey see, monkey do" teaching, and if that learning is wrong you will destroy them as good practitioners of TPM for their entire career. All the bad practices and wrong knowledge they get during their training will be put back into your machinery and become your company's future.

Don't be fooled by the apparent simplicity of a TPM program. Creating uptime is challenging and demanding. It is not easy to win back downtime. Table 1 lists the number of days of lost production in a continuous operation for different values of availability.

To go from a reactive operation with 80% availability to a site with 90% plant availability means halving the number of days lost to downtime. To go from 90% to 95% availability requires downtime to be halved again. To get to 99% availability from 95% means gaining back a further

14 days of downtime. It is impossible to halve current downtime losses using a company's current processes. The downtime that an industrial operation suffers is the result of the processes it uses. Halving your downtime requires using life cycle and business processes that inherently produce the necessary uptime. To go from 80% availability to 90%, then to 95%, then to 99%, means a total replacement and rebuild of the vision, systems, paradigms, knowledge base and skill sets used in a company. For each jump in availability the organization must first develop, and properly use, the right reliability creation and asset management processes with the capability to make and sustain the next jump. Only when an organization recreates itself and builds effective processes to achieve each level of success can the subsequent results be gained. TPM alone can never achieve such world class uptime improvement because it is a very small part of Operational Excellence success.

For Continuous Operation Plant		
Availability (%)	**Downtime** (days/yr)	**Uptime** (days/yr)
80	73	292
85	55	310
90	37	328
95	18	347
98	7	356
99	3.7	361.3
99.5	1.8	365.2
99.9	8.8 hrs	364.7

All the very best to you,

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