Measuring Overall Craft Effectiveness (OCE)

Part I: Are You a Take Over Target For Contract Maintenance?

by

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Introduction: What is Overall Craft Effectiveness or OCE? It is very much like the concept behind the OEE Factor for the calculation of Overall Equipment Effectiveness. But OCE applies specifically to the productivity of craft labor resources. We will get to the practical concept and details of OCE later in Part II, but let's first talk about contract maintenance providers. They clearly support my case for profit centered maintenance and they clearly understand maintenance as a profitable business opportunity. There are hundreds of large maintenance service providers such as the operation and maintenance subsidiaries within Turner Industries, Halliburton (Brown and Root), Fluor Corporation, ARAMARK ServiceMaster, etc, etc. And then there are literally thousands of small providers down to that one person in a van with tools and work order/invoice forms that you and I typically call to fix things around the house we can't accomplish. Maintenance is forever and as a result there will forever be new business opportunities for the true value-added contract maintenance provider.

The Future: All contract maintenance providers (large or small) clearly understand profit and the importance of overall craft effectiveness (OCE) and quality service. Very simply their goal is to perform services equal to and with lower cost than in-house maintenance while making a profit and creating potential savings for you. The future will see third party maintenance continue to replace in-house maintenance operations that have priced themselves out of the marketplace due to low craft labor productivity, poor service and technical skills, lack of internal leadership and of course declining physical asset reliability.

Got Courage? Who will step forward with the courage and the commitment necessary to bring the art and science of profit centered maintenance into your operation? Will it be you or the vice president of ACE Technical Services Inc. who convinces your leadership that:

- "We have the technical know-how and …the leadership capabilities to operate your maintenance operation and take it to another level….a more reliable and profitable level."
- "We will divest it completely from you and slowly sell its services back to you at a profit to us and a net savings to you, right now!
- We will validate immediate short term benefits and continuously measure improvements and benefits to you over the long term." In fact we will share savings with you via lowering of our rates for services. You may actually see a decrease in the need for our services in the future.
- "We will provide both the technical and personal leadership to avert certain failure of your business if you continue along your current path.

- "We will provide a measurable value added maintenance service in the core business requirement that you have obviously given up on."
- "When can we sign the contract and begin to create improved cash flow, increased asset reliability and more profits for your company?"

Are You a Take Over Target? The in-house maintenance operation that continues with rising craft labor costs and no productivity gains and marginal at best customer service will be an easy takeover target. Low craft labor productivity coupled with declining asset reliability, marginal safety and regulatory compliance is a big gamble. And we will never, never win when we gamble with maintenance costs over the long-term!

The Maintenance Excellence Institute continuously emphasizes through our maintenance seminars, speeches, articles (like this one) and consulting work that "the overall maintenance process should be viewed and operated as an internal business and considered as a profit center". We certainly believe that in-house maintenance operations can be competitive with the proper leadership, equipment, tools and application of today's maintenance best practices.

The Good, Bad and Really Ugly: Personally I am pulling for the Home Team; the internal maintenance operation, but ***only*** if there is still hope for them? I have seen the "good, bad and the really ugly" side of contract maintenance starting with really ugly providers of contract repair service to road building equipment in Vietnam in 1970-71. More personal data comes from my experience doing very comprehensive, maintenance excellence assessments at over 200 sites around the world. I have seen expensive contract maintenance being wasted due to poor planning, being under used and stifled because of poor in house practices as basic as storeroom operations and lack of written PM/PdM procedures. A crafts person's time and talents is a terrible thing to waste.

Like wise, as a manufacturing plant manager, I have seen good in-house maintenance operations and have personally experienced the benefits of increased capacity and reliable throughput. Now as a "consultant", I have also seen the good and bad examples and the really ugly ones where ***core competencies*** for accomplishing ***core requirements*** for maintenance were not present. ***Core requirements*** for maintenance of physical assets will never, never go away. ***Core competencies*** to perform in-house maintenance can vanish overnight.

Gambling with Maintenance: Small operations with 2 to 3 crafts people or say less than 10 crafts are the most vulnerable. The loss of your only trained and certified instrumentation technician for example, is a serious loss of a core competency. So now as a consultant, I really do pull for in-house maintenance if there is still hope. But if there is no visible evidence that existing maintenance leaders have a chance or their top leaders continue "gambling with maintenance", I do not hesitate to recommend quality contract providers or increased privatization within a public sector operation. .

Core Requirements for Maintenance Do Not Go Away: The following is taken directly from our Scoreboard for Maintenance Excellence comments summary and applies when the total score is Below Average: **"Immediate attention may be needed to correct conditions having an adverse effect on life, health, safety, and regulatory compliance. Place immediate priority and focus toward key issues, major production assets or facility conditions, building systems and other equipment where increasing costs and deferred maintenance are having a direct impact on the immediate survival of the business. The capabilities for critical assets to perform intended function are being severely limited by current "state of maintenance". Consider immediate contract services as required for business survival and for achieving the core requirements for maintenance services if necessary investments for internal maintenance improvements are not going to be made."** The ***core requirements*** for maintenance of each physical asset must come from somewhere even if leaders have given up on in-house maintenance.

Think Like A Business Owner: On a more positive note, forget the past and think like a business owner. One of the great things about our minds is that they are ours. Yogi Berra may have already said this somewhere but really "our mind is like a canvas with our willpower being the brush. As Dr. Robert Schuller states, "Your thoughts are the oils and colors. Within your mind is an incredible assortment of colors; every idea is a potential color! Begin to "see" ideas in "color."

- Ideas that are happy can be colored red, yellow.
- Depressing thoughts? Color them gray.
- Angry thoughts? Color them black.
- Loving thoughts? Color them blue.
- Forward moving, growth ideas? Color them green!"

The Color of Green: Think about this one important question and color it "green" for increased profit and service from maintenance!

"If I owned my maintenance operation, what can I do different to make a profit?

Secondly think about, "What will it take to regain or increase my core competencies, be competitive against contracted services, to keep more work in-house or avoid a complete take over?"

Today we can choose the attitudes for our own minds. Our Creator gives each one of us gifts of imagination and ideas – the personal thoughts within our own minds. We each have the creative power to draw the mental image and the positive attitudes within our own minds. You must see the finished project of your vision of maintenance excellence in your own mind first. And as Dr. Schuller also says, "If I cannot see it, I will never be it. Until I believe it, I will never achieve it!

Introducing the Overall Craft Effectiveness (OCE) Factor: The profit-centered maintenance leader (in house or contractor) must consider total asset management in terms of improvement

opportunities across all assets and resources. There many questions to be asked about how we can improve the contribution that each of these resources make toward your goal for maintenance excellence:

- Physical assets; equipment and facilities
- People assets; craft labor and equipment operators
- Technical skill assets; craft labor that is enhanced by effective training
- Material assets; MRO parts and supplies
- Information assets; useful reliability information not a sea of useless data
- Team processes; Teams working as a true people asset multiplier

One very key question must be: How can we get maximum value from craft labor resources and achieve higher craft productivity?" Maintenance operations that continue to operate in a reactive, run-to-failure, fire fighting mode and disregard implementation of today's best practices will continue to waste their most valuable asset and very costly resource - craft time. Typically, due to no fault of the craft work force, surveys and baseline measurements consistently show that only about 30 to 40 percent of an eight-hour day is devoted to actual, hands-on "wrench time". Best practices such as effective maintenance planning/scheduling, preventive/predictive maintenance, more effective storerooms and parts support all contribute to proactive, planned maintenance and more productive hands on, "wrench time". Measuring and improving overall craft effectiveness (OCE) must be one of many components to continuous reliability improvement process and total asset management. OCE includes three key elements very closely related to the three elements of the OEE Factor.

Overall Equipment Effectiveness (OEE)

We must clearly understand the elements of OCE and how the OCE Factor relates to better use of our craft work force. We all understand the world-class metric OEE - Overall Equipment Effectiveness that measures the combination of three elements for the physical asset; equipment asset availability, performance and quality output. An illustration of OEE:

The OEE Factor = % Availability(A) x % Performance(P) x % Quality(Q)
An OEE Factor of 85% is recognized as world-class
Therefore OEE of 85% requires at least the 95% level for each of the 3 elements:
So if OEE = A x P x Q then
OEE = .95 x .95 x 95 ≅ 85%

Overall Craft Effectiveness (OCE)

The OCE Factor focuses upon craft labor productivity and measuring/ improving the value added contribution that people assets make. Just like OEE, there are three elements to the OCE Factor:

- the effectiveness factor
- the efficiency factor
- the quality factor

However, only two elements of OCE can be as well defined as all three of the OEE Factors. We will now review the three key elements for measuring OCE and see how they very closely align with the three elements for determining the OEE Factor for equipment assets.

Overall Craft Effectiveness (OCE)	Overall Equipment Effectiveness (OEE)	Elements of OEE and OCE
1. Craft Utilization or Pure Wrench Time (CU)	Asset Availability/Utilization (A)	Effectiveness
2. Craft Performance (CP)	Asset Performance (P)	Efficiency
3. Craft Service Quality (CSQ)	Quality of Asset's Output (Q)	Quality

Calculating Overall Craft Effectiveness

The OCE Factor = % Craft Utilization (CU) x % Craft Performance (CP) x % Craft Service Quality (CSQ)
Therefore OCE = % CU x %CP x %CSQ
Typically CU and CP can be easily measured.
Craft Service Quality (CSQ) is somewhat harder to measure and can be more subjective.

Later in Part II we will see how all three elements of OCE can be measured and how all three contribute to increased craft productivity

OCE Focuses Upon Your Craft Labor Resources: I strongly believe in basic maintenance best practices as the foundation for maintenance excellence. There must be what I call continuous reliability improvement (CRI). CRI is about maintenance business process improvement that includes opportunities across all maintenance resources; equipment and facility assets as well as people resources-our crafts work force and equipment operators. CRI must also include MRO materials management assets, maintenance informational assets and the added value resource of synergistic team-based processes**.** Continuous Reliability Improvement improves the total maintenance operation and can start with measuring and improving OCE.

The Maintenance Excellence Institute advocates, supports and clearly understands the need for the reliability-centered maintenance (RCM) and total productive maintenance (TPM) types of improvement processes. But out on the shop floor we see today's trend toward forgetting about the basics of "blocking and tackling" while going for the long touchdown pass with some new analysis paralysis scheme. RCM is not analysis paralysis when done correctly with true information and not based upon "precisely inaccurate" data.

Build Upon the Basics: Your approach must be built upon the basics and then include, but go well beyond the traditional RCM/TPM approaches to Continuous Reliability Improvement.

Figure 1

Maintenance Excellence Can Start With PRIDE in Maintenance: Do not take a piecemeal approach that focuses only RCM type processes on physical assets and equipment resources. Often the maintenance information resource piece, among others, is a missing link for the successful RCM-type process. RCM alone can often become analysis paralysis with no data or bad data. Your approach should be about improvement opportunities across all maintenance resources. There of course must be priorities as to where we start and where we make investments. For example with the craft labor resource we can easily measure the three elements of OCE as we will see later in Part II. But we can start the journey to maintenance excellence by just helping to achieve PRIDE in Maintenance from within the crafts work force and among maintenance leaders at all levels.

What if we could get attitudes plus action from all our crafts focused on this question;

"How would I do this job or lead this crew if it were in fact my own maintenance business?"

It is very often your own internal people that will add greater value to their own maintenance operation with a profit-centered attitude about their job and the profession of maintenance. And we feel strongly that maintenance excellence begins with PRIDE in Maintenance. In Part II we will see "How OCE Impacts Your Bottom Line" and how we can measure and improve the productivity of an important maintenance resource; craft labor.

References

Dunn, Richard L. (1997), "Plant/Facilities Engineering-Definitions and Descriptions of Functions and Responsibilities", *AFE Facilities Engineering Journal*, Dec 1997.

Higgins, L.R. *Maintenance Engineering Handbook*, 5th Edition, McGraw-Hill, 1995.

Peters, R.W. (1978), "The ACE Team Benchmarking System", NC Department of Transportation, Raleigh, NC

Peters, R.W. (1987), The *Scoreboard for Excellence*, Ralph W. Peters and PEOPLE, Raleigh, NC.

Peters, R.W. (1994), *Achieving Real Maintenance Return on Investment*, Tompkins Associates, Raleigh, NC.

Peters, R.W. (1994), The *Scoreboard for Maintenance Excellence*, Tompkins Associates, Raleigh, NC.

Peters, R.W., (1996), *Planning for Maintenance Excellence*, Tompkins Associates, Raleigh, NC

Peters, R.W. (1998), "Benchmarking Your CMMS System", *Industrial Maintenance and Plant Operations*, May 1998

Peters, R.W. (1999), *The Guide to Computerized Maintenance Management Systems*, Alexander Communications/Scientific American, New York

Peters, R.W. (2001), Chapter 12- Maintenance in book by: Tompkins, Jim. *Future Capable Company*. Raleigh, Tompkins Press, 2001.

Salvendy, Garviel, *Industrial Engineering Handbook, 3rd Edition, Chapter 59- Maintenance Management and Control* by Peters, R. W., John Wiley and Sons, 2001

Peters, R. W., *Maximizing Maintenance Operations for Profit Optimization*, EBOOKAMATIC, Schneiderman and Associates, LLC, Tulsa, 2002

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Bio of Ralph W. "Pete" Peters

Pete Peters, founder of The Maintenance Excellence Institute and President of Ralph W. Peters and PEOPLE Inc has over 30 years of practical engineering expertise, operations management and maintenance responsibilities in both the public and private sectors. He has helped operations such as the University of NC-Chapel Hill, Boeing, Heinz, General Foods, Consolidated Stores, Marathon Ashland Oil, Polaroid, Great River Energy, Wyeth-Ayerst, Cooper Industries, National Gypsum, Lucent and Carolinas Medical Center achieve success in plant, fleet and facilities maintenance operations. Pete is a senior member of the Institute of Industrial Engineers, the Association of Facility Engineers and the Society of Maintenance and Reliability Professionals.

He has served two manufacturing operations as a Plant Manager and as Director of Facilities Management where he managed a 225-employee physical plant operation with over $30 million annual budget and eight million square feet of facilities including the State Capitol of North Carolina. Responsible for all physical plant operations, construction renovation, planning and inventory management. Responsible for commissioning three major office buildings and a new central steam plant without significant staff additions.

Also served as Director, Productivity Management, NC Department of Transportation and helped establish the first fleet maintenance management system in US for measuring, planning and scheduling of fleet maintenance work with operator-based preventive maintenance, planner selection and training, maintenance performance reporting and team-based maintenance improvement. During his NC Army National career, directed maintenance operations at company, battalion and brigade levels to include command of a direct support maintenance and supply company in combat zone (Vietnam). Certified as a Total Quality Management facilitator for the National Guard Bureau.

He is also retired from the US Army Corps of Engineers/NC Army National Guard (1995) with 28 years of concurrent service and serving in Viet Nam and during Desert Storm. Pete is author for the upcoming books*; Profit-Centered Maintenance* and *PRIDE in Maintenance: I, II and III* and was editor/primary author for *The Guide to Computerized Maintenance Management Systems*, Scientific American Newsletters LLC, author of the maintenance chapters in *The Warehouse Management Handbook* and *The Future Capable Company* from Tompkins Press and John Wiley's new 2001 *Handbook of Industrial Engineering*, *3rd Edition*.

A recognized leader in the areas of implementing maintenance best practices, profit-centered maintenance strategies, performance measurement, and providing value-added total operations consulting. He is also the author of over 200 articles and publications and as a frequent speaker has delivered presentations on manufacturing and maintenance-related topics worldwide.

Pete received his BSIE and MIE from North Carolina State University and is a graduate of the US Army Command and General Staff Course and the Engineer Officers Advanced Course.