USCCG METRICS

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Six Steps to World Class Maintenance

A world class maintenance operation differs from the run-of-the-mill operation only by the degree to which it ensures that the right amount of equipment is ready and available at the right time, at the right place and at the right cost.

"Most companies could do a much better job of measuring maintenance," says Dean Carrier, operations manager with USC Consulting Group. "A standard measurement in any operation is the volume of product produced per direct labor hour utilized, but maintenance organizations seem to believe that this practice doesn't apply to them."

Instead, maintenance staff evaluate productivity based on which specific employee does the work. "Production people say it doesn't matter who mans the machine center or drives the truck. They still expect a specific amount of work to be completed during a shift."

Maintenance organizations, on the other hand, tend to believe that a certain amount of work will get done by noon if the job is assigned to Joe Smith, but, if Bill Jones gets the assignment, the work won't be done until next Tuesday.

"Maintenance organizations tend to lack detailed metrics and historical measurements," says Carrier, "so they can't really focus on what needs to be improved."

Building Best Practices

Carrier cites five key components for attaining world class maintenance status as defined by Terry Wireman, author of *World Class Maintenance*:

- quality equipment maintenance;
- a positive attitude toward preventive maintenance (PM);
- labor planning;
- inventory control; and
- automation in the field to optimize the maintenance department's ability to meet its goals.

Each of these areas must be tracked closely to promote quick problem spotting and even quicker resolution. That means looking at such basics as costs, availability, reliability, overall practices, and how personnel are used.

"Inventory and inventory dollars are significant here," says Carrier. "For example, it's extremely important to look at critical spares and non-critical spares and consumable supplies - anything that ultimately gets used up or thrown away. What are we actually buying and spending? What's in the warehouse? What do we actually need and when?"

Planning also plays a big role in world class maintenance practices. Every operation has a master plan, but how effective is it?

"Every operation claims to have a solid production plan or capacity plan," says Dave Shouldice, USCCG senior operations manager. "If that's the case, what's keeping so many companies from reaching world class status?"

Carrier says that most are experiencing at least some of the same recurring problems, among them:

- Computerized maintenance management systems don't deliver expected benefits;
- Production constantly changes daily maintenance plans;
- Production and maintenance resource capacity planning don't relate to one another;
- Planned shutdown times on equipment are overrun;
- Outside contractors are mismanaged;
- Work order disciplines are overlooked;

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Maintenance continued

- Labor productivity is poorly defined; and
- Maintenance costs-per-unit are stagnant or increasing.

These problems stem from a number of common mistakes.

In many cases, labor hours, trade skill and parts requirements are not estimated for work orders. Often orders are issued without proper materials on hand, which slows maintenance and creates a serious backlog. This situation results in a loss of faith in the system, and a subsequent lack of its use all together.

Maintenance shutdown plans are not made against a timeline, so that downtime is often far longer than anticipated. Even then, shutdown postmortems are rarely, if ever, conducted to determine causes for delays. And, frequently, employees and supervisors are not trained to drive to the root cause of problems, so that Band-Aid solutions become the accepted norm. This is the number one source of friction between maintenance and operations.

Preventive maintenance routines are seldom reviewed, a practice USCCG recommends be done at least once a year. Records are not centralized or easily accessible, so that predictive maintenance practices are difficult to develop.

While emergency repairs can never be eliminated, they can be minimized. The key is to create a method for analyzing what is failing, why it is failing and how to avoid the failure. One way to accomplish this is to implement Mean Time Between Failure as a primary metric in the maintenance operation. This requires a good equipment history documenting repairs and tracking how long parts are in operation before failure. Using a Pareto Chart as a tool, each type of equipment can be analyzed to determine which parts are causing unscheduled repairs. Following up with a root cause analysis will help to determine if the operation should:

- go to predictive maintenance (change out after a set number of hours of operation),
- choose a different supplier for longer part life,
- change the PM program, or
- change operating procedures.

Climbing the World Class Ladder

"You can't look at the maintenance process in isolation and expect to attain world class status," explains Joe DiNapoli, USCCG senior operations manager. "You have to look at the whole company and involve people from every level. Certain things must done and certain changes must take place, for example, within the production group or operations group, in order to facilitate the maintenance operation."

"A world class maintenance operation... ensures that the right amount of equipment is ready and available at the right time, at the right place and at the right cost."

Step One: Determine Where You Stand Today

The first rung on the ladder to world class status requires manufacturers to determine where they stand today against world class maintenance practices. This entails three actions. The first is to perform an in-depth survey in all main areas, including:

- maintenance organization,
- training programs,
- work order system,
- planning and scheduling,
- preventive maintenance,
- inventory and purchasing,
- reporting, and
- automation.

Then, develop a pictorial overview of the current flow of maintenance information. This requires involving every employee in a review of his role in the maintenance process and putting every activity into a schematic diagram. Focus on "the life cycle of a work order" and the metrics currently used to determine the effectiveness of the department and its interactions with other departments.

Finally, do a series of task observations to learn what actually impedes the maintenance people in accomplishing their daily assignments. Spend full shifts with the tradesmen to see the operation from their eyes. Document and graph the percentages of their day spent adding value, performing non-value-added tasks or idly waiting for something to happen. It is not unusual to find that value-added time is well below 50% of a tradesman's day.

"This first step is one of the toughest for any manager," says Carrier. "Every day he says he's going to make a difference. Then the realities set in and he never has time to tackle some of those big critical issues. This is why companies like USCCG can help jump-start the process. We have the tools and the knowledge to come into any operation and get the ball rolling."

Step Two: Create a Vision for the Future

Use the results from the first series of assessments to design a vision which can be communicated throughout the operation. The vision doesn't have to be detailed, but it must show a firm commitment by the site's senior management team to do things differently to make the operation more effective.

Step Three: Involve Employees

This is where the catalysts for success are generated. "Pulling in every employee and involving each one in developing a better system is key," DiNapoli emphasizes.

Carrier adds, "There's always some resistance to this approach. Many employees will say, 'Heard it all before.' But once they are presented with hard facts and a new system that they've helped devise to make their lives easier and their work better, they accept the validity of the approach."

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Use an Employee Involvement Prototyping process to engineer change and achieve buy-in. Do this by choosing one shutdown, one work group, or one tradesperson to develop and prototype methods of planning and scheduling, controlling, reporting, and improving the operation to meet the challenges laid out in Step Two. The key to success here is a daily review meeting, attended and chaired by the senior management team. Their role is to demonstrate solid support during the transition process and to pose five basic questions at every review meeting:

1. What did you learn?
2. What did you like and dislike?
3. What do you want to change?
4. Who will be responsible for making the change happen?
5. When will it be done?

Step Four: Roll Out Successes Across the Organization

This can be done very effectively by promoting the success of the prototype. Also, by developing a complete management system around the prototype, buy-in is more quickly achieved.

Avoid the temptation to implement the changes across all work groups simultaneously. This is very difficult to control and risks the success of the change process. A supervisor and his crew are a natural grouping for initial implementation. Then roll out the changes starting with the work groups most open to change and proceed to those most resistant.

Don't be shocked if, early in the establishment of the new systems, maintenance costs increase. This is only a temporary state created because more materials are being consumed. It will right itself as practices come into balance and processes are streamlined.

And find a reason to celebrate each successful installation. This further fosters employee buy-in and their long-term commitment to the changes.

Step Five: Audit for Compliance

Once changes have been implemented, they must be maintained through a continuous commitment to the rigors of the new system. That means keeping the same discipline and focus adopted when designing the new systems.

Use an audit to measure compliance and identify backsliding. World class performance is a never-ending journey and it's easy to lose the way when you stop paying attention to the system. To stay on the path, develop a System Audit and use it on a quarterly basis. The audit is crucial in determining the level of adherence to the system rigors and to alert management if further changes are required as a result of changes to the process.

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USCCG recommends the system pieces and disciplines be incorporated into existing quality management systems like ISO certification.

Step Six : Automate the System

Automate, but don't expect automation alone to lead to improvement.

"The difficulty in starting with automation," Carrier advises, "is that it doesn't fundamentally change anything that is already being done. Labor productivity won't change just because work orders are in a database versus a filing cabinet. Inventory turns won't increase - or stock-outs decrease - unless the procedures and rules for purchasing and inventory control are changed."

In one company, for example, an automated maintenance system was put in place in the hope that it would improve the maintenance department's productivity by 20 to 30%. When USCCG came on the scene a year later, they compared the current maintenance performance characteristics to that of a year before. They looked at such items as the Mean Time Between Failure, labor productivity (actual hours worked versus estimated hours on the work orders) and meeting maintenance schedules.

None of the numbers had changed with the introduction of automation. The operation now had lots of reports available for analysis, but management either didn't believe the numbers they produced or the reports were not particularly user friendly. After talking with a number of mechanical and electrical people in the shops, USCCG learned that everyone knew what was available from the warehouse, but nothing in the system had changed to help get the parts from the warehouse to where they were needed.

"Basically, automation didn't change the culture of the operation from a reactive, emergency fire fighting organization to a preventive or predictive one," reports Carrier. "Without careful analysis of the various activities required to complete a maintenance task, identifying causes of failures or making adjustments to routing, automation brought nothing to the party."

The key to making automation really work is to change the process and the culture first, then automate it to make the process easier to manage. And take the time to look for the best fit. An automated system that works miracles in one situation may not necessarily be the best solution for another one.

Rank Your Maintenance Status

USC Consulting Group offers a free audit for ranking your maintenance operation against world class maintenance practices. Simply contact USCCG Executive Vice President Jack Korpela at 905-673-2600 or by e-mail at jack.korpela@usccg.com.

Use Financial Metrics to Evaluate Consultants' Value

A case for more accurately assessing a proposed consulting engagement

By Fred Buchold, Director of Finance & Administration

What does an investment in plant or equipment have in common with a major consulting project? A lot more than you might think. Even though accountants invariably treat one as a capital expenditure and the other as an expense item, from the CEO's perspective both represent significant investments and should be evaluated accordingly.

I believe that most clients today decide to use consultants for the right reasons, but evaluate their cost and contributions the wrong way. Using one or more of the financial measures commonly applied in the capital budgeting process, in addition to traditional operating and financial yardsticks, may be a better way to make the most informed business decision. Yet, this is rarely done. Many consultants prefer to be evaluated on "softer" measures, like their ability to bring about cultural change or improve quality, instead of what they contribute to the balance sheet. As a result, consulting projects continue to be justified in one of three ways:

- based on payback time;
- using anticipated savings expressed as a percentage of the project fee; or,
- by improvement on operating performance metrics like productivity, scrap rates or inventory turns.

In fact, they should be judged based on their contributions to the bottom line, just like any other earning asset of a company.

Thus, a consulting project should be authorized, at least in part, based on three criteria commonly applied to a capital expenditure:

- amount of funding required;
- timing of the expenditure; or
- anticipated return on investment.

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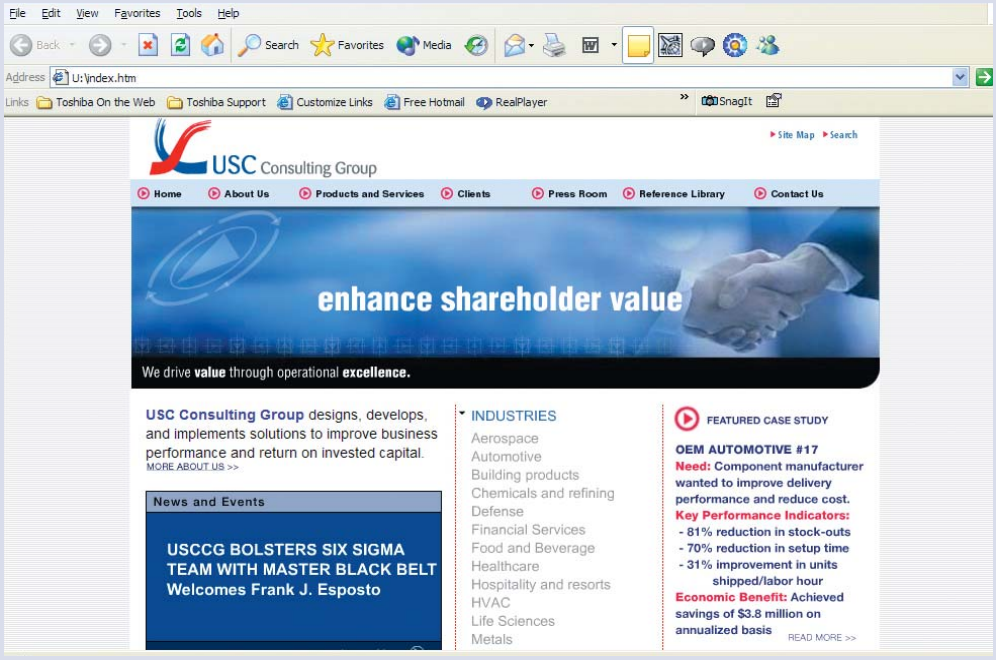
The Site Stuff

Website Gets New Contemporary Look

This fall marks the debut of USCCG's third generation website. Icons and dark colors give way to abundant color photography and generous white space in a total departure from the earlier site. Other enhancements include a totally redesigned home page featuring dynamic new product, messaging, case history and testimonial sections. Visitors will be able to take online polls while clients and prospects will have password-protected entry to satisfaction ratings. Content too has expanded in keeping with the firm's growing service delivery capabilities within and across most major industries.



Progress Report

David Blatchley, New HR Manager

David Blatchley comes to USCCG as human resources manager from Accenture HR Services in St. Charles, Illinois, where he was a consultant and corporate training coach. In his new role, he will be working with USCCG management to strengthen recruiting, hiring, assessment and orientation processes.

Mr. Blatchley's earlier experience included a stint as an economic and financial consultant with the Federal Reserve Bank and as a history and government teacher at Lisle and Plano High Schools, all in the Chicago area. He holds a bachelor of arts degree from Western Illinois University and a Master of Business Administration from Benedictine University in Lisle, Illinois.

Steve Steadman, New BDA

Stephen Steadman joins USCCG as a business development associate with responsibility for setting introductory meetings with prospective clients. He will support Business Development Executives Bill Strong, Jeff Chandler, Jim Cusack and Ron McTavish in the southwestern and western regions, and Brent Jennings and Rudy Hrubala in the northeast. He is based in the Tampa office.

Mr. Steadman was most recently a senior area manager with IPA/IBA, an Illinois-based management consulting firm. Earlier he was president of Steadman Financial Services and agency manager with Allstate Insurance Company, both in Bradenton, FL. He has also held management positions with Orkin Pest Control's Commercial Division in Pinellas Park, FL, and with Hughes Tool Company, Denver.

He earned a degree in business administration from the University of Houston in 1978.

Buchold continued

Amount of Funding Required

When considering adding a major piece of machinery to improve production, one important issue to address would be whether to lease or buy. Another would be the expected life span. And still a third might be the revenue flow it is expected to generate over that period discounted for inflation back to a net present value (NPV).

With a consulting project, an analogous issue might be determining whether a company could undertake the project themselves using only internal resources. Another could be determining how long the expected improvements might last or the value of the improvements over that period of time relative to their opportunity cost today. In both of these cases, positive NPVs argue in favor of proceeding.

Timing of Expenditure

Another consideration is timing. In the previous example, if the company was strapped for cash, leasing might be the better alternative, regardless of NPV. With a consulting project, there is usually a choice between paying as you go, paying out of savings generated or some combination of the two. But, unlike the leasing option, savings rarely come so rapidly - particularly during the diagnostic phase of an engagement - so project fees can sometimes burden cash flows short-term, while adding to revenues in future reporting periods.

Return on Investment

A plant, division or company will typically request capital in order to increase capacity, improve productivity, enhance quality, reduce costs, or comply with safety or regulatory requirements. Regardless of whether the expenditure adds to revenues or mitigates risk, there must be an acceptable return on cash outlay compared to alternate uses for the same funding.

Commonly referred to as an internal rate of return (IRR), this financial metric is calculated the same way for a project fee as it is for a machine purchase. It requires:

- the cost of capital;
- discount rate; and
- an expected revenue or savings stream over a specific time period.

Using IRR as a common yardstick gives senior management a more objective way to view and set priorities among projects competing for limited capital. It also reduces the emotional ties to pet projects, allowing for easier consensus-building and faster decision-making.

The Bottom Line

So, the bottom line, after all, is the bottom line. Projects, like capital expenditures, that meet or exceed hurdle rates, thereby adding economic value, should be viewed favorably. Those that don't should never again see the light of day.

USC Consulting Group

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