Executive Summary

In every business, leadership’s ability to create a compelling shared vision, lead the way throughout the journey, and develop internal organizational capabilities determines success or failure. Companies that do this well consistently outpace competitors. Companies that don’t are often blindsided and find themselves ill-equipped to compete in markets they once dominated.

A world-class Operational Excellence System, no matter what name a business gives it, is an overall operational management system which ensures long-term competitiveness and advantage through superior organizational capabilities. This system aligns employees with common goals and objectives, fosters consistent management support and follow up, and is equipped with robust processes which ensure employee success. The only way to attain a world-class Operational Excellence System that will endure is to develop one internally that is integrated with all aspects of business management, incorporates organizational and geographical culture, and has improvement mechanisms and methodologies built into it.

Some businesses attempt to copy another company’s system, but a cookie-cutter, tool-based approach will never be successful long term. At best, short-term success that is highly leader dependent will be exhibited and quickly erode after the changing of the guard.

At XCELLUS we recommend a unique approach to obtain immediate results and ensure continued success long after we leave. Our expertise is not in providing a solution in search of a problem or installing a collection of tools, but in building leadership and workforce capability and self-sufficiency. This paper summarizes the XCELLUS roadmap to success.

"Companies that are more efficient than their competitors in providing customers with high-quality goods and services will thrive. Companies that are less efficient than their competitors will perish. “
- Toyota
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INTRODUCTION

As a leader of a company, it is incumbent upon you to get the most out of every asset and liability that you can. Labor is in the liabilities column of a balance sheet, and for a good reason. Labor is one of the most challenging expenditures a business makes and, often, the business gets far less in return than is possible and should be expected. Most improvement experts will tell you that your labor force is your greatest asset, but that is often not true.

At the end of the day (every single day) you, as a company leader, should be getting the most out of every asset and liability. If you believe you are unable to get more out of the workforce each year, then consider moving production to a country where labor is $0.11 per hour where the people walk for miles and stand in lines to get those jobs. Or, if a $500,000 robot can do the job, use a robot. What a robot cannot do, and neither can slave labor in other countries, is improve your company; every person in your company can.

Today nearly all companies have some form of Operational Excellence or Continuous Improvement program, but should they? Unfortunately, Continuous Improvement is too often seen as something done in addition to “normal” work. This is, of course, the wrong way to think about continual improvement. World-class organizations (WCO) see continual improvement as A primary responsibility of every employee and THE primary focus of front line and middle management.

In the manufacture of product, Production rules. In the service industry, providing service is paramount. However, only through continual improvement can a company ensure long-term competitiveness and viability. Without world-class continual improvement, no matter what is produced or service delivered, someone somewhere will inevitably do it better and for less.

"Well, in our country," said Alice, still panting a little, "you'd generally get to somewhere else — if you run very fast for a long time, as we’ve been doing."
"A slow sort of country!" said the Queen. "Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"

- Lewis Carroll’s Through the Looking-Glass

The worldwide business landscape moves continuously; it is never stagnant. The Red Queen Theory, as applied to business, means that even if a company is improving, it must improve at a faster rate than its competition or the business is really not improving at all. The company is actually staying with or falling behind its competition.

Building superior internal capabilities is the only sustainable way to consistently attain higher levels of operational excellence through the never-ending journey.

Contrary to popular opinion, what Toyota perfected will likely NOT work for another company. That’s not a problem, though. Why would any company want to copy the Toyota System they created decades ago? Toyota is a learning organization and has been continually improving every day since then. At best, companies are copying old tools Toyota developed in response to rigorous problem solving.

There is no silver bullet, magic wand, or cookie-cutter continual improvement approach. Though principles always apply, every company and culture is unique and therefore every Operational Excellence approach must be tailored to meet the needs of each company.
XCELLUS professionals always begin with the end in mind, which is organizational capability and long-term self sufficiency. In the end there is no need for separate continuous improvement professionals; continual improvement is an integrated part of every employee’s job and managed by existing leadership at every level. Everyone in the company should be a continuous improvement specialist. With the right guidance, every company can create a world-class Operational Excellence System that will endure and is adaptive to the ever-changing world.

“Begin with the end in mind.” Then, “First things first.”
-Stephen Covey
2 EFFECTIVENESS FIRST – EFFICIENCY LATER

“There is nothing so useless as doing efficiently that which should not be done at all.”
“Efficiency is doing things right; effectiveness is doing the right things.”
- Peter Drucker

2.1 Align Employees

The single most important thing any business can do to be more effective is align all employees and their activities with the strategic direction of the business. This is always the first step. When employees clearly know what is expected of them, why it is important, and what constitutes success they will work toward that end. Employees at every level must know if they are succeeding or failing each and every day.

Failure to align employees in the same direction causes wasted efforts, competing priorities and frustration for all in the end. A football team has individuals with different roles and responsibilities doing different things. A winning football team applies their different skillsets and roles but works together as a team to accomplish the objective and does it better than the competition.

Actions taken by employees should always be to either ensure success or as response to failure or potential failure. Therefore, every tactical action taken by employees must be tied directly to business strategy.

Failure to align employees can create enormous amounts of waste because people will take action. They will do “something” if just to make their life easier even if it makes work more difficult for others and does not align with organizational strategies.

“If you don’t know where you are going, any road will take you there.”
- Lewis Carroll

2.2 Strategy Deployment

Strategy deployment is all about aligning people to maximize their efforts in the pursuit of mission success. Strategy deployment shows people the road that leads them there.

The strategy deployment process is about turning goals into objectives, objectives into strategies, and strategies into tactics and activities. Strategy deployment is not a one-time offsite event for the executive team, but an ongoing direction-provider that is revisited and revised as needed to adapt to the ever-changing business landscape.

2.2.1 Vision and Mission

In order to unite employees a company must have a compelling vision of the future that captures the hearts and minds of its people. A good company vision is something the company hopes to become. It inspires and gives people a sense of belonging to something more important than themselves. A company vision should make employees want to help the company get there. A great vision will also make customers and competitors take notice.

The path from the current state or situation to the visionary state should not be clear or known in advance. If a leader can clearly see the path to the visionary state, the vision is shortsighted, unimpressive, and unlikely to inspire.
A good mission statement gives employees a sense of purpose. It describes what the company does or is trying to accomplish, the more specific the better. It should relate to the primary reason for company existence and be achievable; it defines the operational boundaries.

Unfortunately, Vision and Mission are too often ineffective, misunderstood, and even meaningless words and statements corporations create because they think they should. They often don’t inspire employees, customers or shareholders.

World-class organizations don’t create vision or mission statements just because it is expected. A poor effort on company vision and mission has the exact opposite of the desired impact on people. Employees know when leaders merely go through the motions.

2.2.2 Goals

Leaders determine the long-term goals of the company. These are commonly three to five-year aspirations the company seeks. However, goals can be much farther into the future than five years. Though goals are revisited annually, they often change slowly. Sometimes goals do not change for years.

At the corporate level, there are typically secret strategies designed to create competitive advantage that are not communicated and not part of the general strategy deployment process.

2.2.3 Objectives

Next, company divisions determine the near-term objectives that support goal attainment. Objectives are typically fiscal-year metrics that directly contribute to the long-term direction the company is headed. Objectives typically relate to delighting customers, shareholders, employees, and the community. Objectives define success at the divisional and functional levels.

Objectives are often the easiest component of strategy deployment. Standard metrics usually apply and often remain year after year, but the most overlooked objectives frequently relate to employee delight and the community.

In a manufacturing environment Operational Availability (OA) is a common metric that could be used as an objective to ensure improvement in equipment performance.

**Example of an objective related to OA:**

- Increase plant-wide OA to 70% this fiscal year

Objectives are determined by the division leadership and validated with corporate leadership. Corporate leadership challenges the objectives where appropriate and asks for data that supports the objective choices made by the divisions.

Every objective must directly connect to one or more goals.

Both goals and objectives should be **SMART:**

- Specific
- Measureable
- Attainable
- Relevant to Vision and Mission
- Time Bound
2.2.4 Strategies

“Strategy without tactics is the slowest route to victory. Tactics without strategy is the noise before defeat.“
-Sun Tzu

Strategies define HOW an organization or function achieves success. Determining business strategies that directly support objective attainment is often the most difficult part of strategy deployment.

At this critical stage, middle managers determine the major strategies within their areas of knowledge and authority. Managers work with their teams to brainstorm ways of achieving success for the business. These teams select the strategies they believe they can support and present them to upper management as the way the team will support the objectives.

Upper management challenges middle managers on the strategies in order to understand why their teams believe their strategies will result in objective attainment and position the business for future success.

**Examples of strategies related to OA:**

- **Maintenance**
  - Become world-class in maintenance and reliability utilizing Reliability Centered Maintenance (RCM) best practices
- **Engineering**
  - Eliminate machine failure recurrence with effective problem solving and root cause analysis

2.2.5 Tactics

“Bad tactics will destroy even the best strategy.“
- General George S. Patton

Tactics are the detailed action plans describing what is done to support the strategies. There are usually many tactical contributions to reinforce any given strategy. Tactics are developed within the teams containing the subject matter expertise. The subject matter experts (SME) are in the best position to know the industry best practices, but they frequently need a facilitator to get them out of their current way of thinking and pull ideas for a better way of doing the job out of them.

**Examples of tactics related to OA:**

- **Maintenance**
  - Implement a PM optimization program that supports equipment uptime beginning with constraint equipment
- **Engineering**
  - Redesign repeat failure of equipment components to increase MTBF at constraint operations 3% this year

One of the biggest risks associated with strategy deployment is the potential for micromanagement. WCO’s always hire the best and then get out of their way so they can do their jobs. It is critical to a satisfied workforce that they are not micromanaged.

XCELLUS facilitates strategy deployment every step of the way with all levels of the organization. The strategy deployment process is the first step for every successful endeavor.
3 ENGAGE EMPLOYEES IN BUSINESS SUCCESS

People can be the greatest asset any company has. Employee capability impacts company viability more than any other factor. It is surprising how infrequently company leaders and managers behave like they believe this is true. Only through engaged people solving problems and implementing improvement ideas can businesses become more productive and consistently deliver high-quality products and services that outpace the competition.

3.1 Engage Employees

Employee engagement has become a popular topic of discussion over the last several years. All businesses want engaged employees; very few businesses actually have them.

Truly engaged employees design, manage and improve their own work. Engaged employees take pride in their work; they do not “coast” through the days and weeks waiting to collect paychecks. Engaged employees are proactive in implementing ideas for improvement and use the scientific method to solve problems when they arise.

Employee engagement can be difficult to manage because it is sometimes problematic determining meaningful measures of true engagement. Surveys can provide insight into how employees feel, but do nothing to create engagement. It is far better to directly measure the activities engaged employees do, and build management systems to support those activities. The system should include daily review of engagement activities, like improvement projects, completed Kaizens, and 8D’s.

3.2 Human Behavior

Much has been written about human behavior over the years, and little has changed. Much of what is important in a business environment can be gleaned from Maslow’s famous hierarchy of needs and Herzberg’s motivation theory.

Under most circumstances, an employee’s work life relates to the top four needs, beginning with safety needs, which is more important than the remaining work needs.

![Maslow's Hierarchy of Needs]

If a company cannot meet safety needs (stability, security, protection), then spending time and money attempting to provide belongingness, esteem and self-actualization needs will have limited success. While nothing is certain, it is leadership’s responsibility to create an environment that is as stable as possible within reason. A pattern of hiring and laying off workers shows disrespect for people, causes feelings of instability and insecurity, and creates disloyalty. This should be avoided whenever possible. It is important to develop a production and manpower strategy that minimizes or prevents this behavior.
It is not enough to provide a feeling of security. As Herzberg discovered in the late 1950’s, security is what he called a hygiene factor. People need to feel secure enough. The same is true of salary; pay people enough to take the subject of salary off the table, but not more. These findings are not surprising because they fall into safety needs.

On the other hand, there are real opportunities for leadership to develop strategies and tactics focusing on the extreme satisfiers (achievement, responsibility, recognition) and extreme dissatisfiers (company policy and administration, supervision, working conditions).

### 3.3 Employee Pride

Leveraging employee pride is an important strategy for every business. While each business is different, every company must find something to awaken or enhance pride in its workforce.

This should be a strategy driven by Human Resources and part of every manager’s standard work to encourage and support.

### 3.4 Problem Solving

The responsibility and authority to solve their own problems and to get the help that is needed is fundamental to increasing productivity, quality, and employee engagement, as well as reducing cost. This is an important strategy for creating a culture of effective problem solvers and a healthy population of mentors in the problem-solving process.

There are generally two primary types of problems that exist: the sporadic, or special-cause, problems that have an assignable root cause and the chronic, or common-cause, problems that require rigorous investigation. There are different methodologies for both problem types and application of the wrong methodology is mathematically incorrect, reduces workforce understanding and capability, and ultimately will not prevent problem recurrence.

A simple system is required to ensure people react to problems with efficient problem-solving methodologies and tools as every problem arises. The system should include built-in, standardized, and consistent management follow up and reviews to ensure the system is working as expected.

Only by determining the real root causes and eliminating them can the effect be prevented from resurfacing. Through the relentless pursuit of root-cause elimination and coaching by leaders competitive advantage is achieved and maintained.

### 3.5 Turn Ideas Into Improvements

Employees that convert their team’s ideas into real improvements in their work, productivity, and quality also take pride in their work, job, team, and company. This fundamental belief drives the “Kaizen” process. Kaizen is Japanese for “change for the better” or continual improvement.
Contrary to popular opinion in the Continual Improvement community, Kaizen is NOT an event, it is an ongoing, continual process.

Improvement responsibility, authority, and accountability must be driven to the front-line employees. Within their teams, and according to policies, engaged employees actively implement ideas for improving their work and make their company more competitive through productivity and quality improvements.

A standard process for generating, submitting, approving and implementing improvement ideas is critical to foster a culture of continual improvement. Leaders provide mentoring and support throughout the process.

3.6 Measure What Matters

Other key components of employee engagement are the metrics employees track and those that define their success. Companies with world-class operational excellence take care not to have employees track and display meaningless metrics, or judge employee performance on metrics outside their ability to influence or control.

Also, WCO’s make certain that every metric directly relates to strategic deployment. All metrics that matter should drive action when in an abnormal or unacceptable state; if no action occurs when a metric is in a “red” condition it must be reviewed for relevance.

WCO’s stop collecting, tracking, and reporting metrics that do not meet the above criteria. This increases their organizational effectiveness.

3.7 Never Tolerate Poor Performers

Most companies want “A” players and have processes to terminate the poorest performers, but only the best companies act quickly and decisively when it comes to mediocre performance.

A leader is only as good as the people working for him or her. Hire the best, set high expectations, and allow them to do their job. Next, leaders remove roadblocks and eliminate the average and poor personnel that frustrate top performers. A-string players do not want B-string or C-string players on the team, because team performance is impacted.

Tolerating pedestrian performance will result in turnover of high-potential employees. Those that remain bias the quality of the workforce toward below average. As positions open, the survivors move into the open positions more often than outside hires. This survivor bias negatively impacts the quality of management over time.

An active high-potential program should exist or be developed to give achievers an exciting career path and advancement potential free from the shackles sometimes imposed by mainstream Human Resource departments.

Ongoing performance assessments and reviews should be designed to more quickly identify top performers as well as those in need of performance improvement. Eliminate the once or twice per year performance evaluations in favor of high-frequency one-on-ones to reinforce good performance and formal periodic reviews designed to identify performance gaps and develop improvement plans.

Every year, the bottom 20% of the workforce should be eliminated at every organizational level.
4 MANAGEMENT ROUTINES – EXCELLENCE IS A HABIT

“We are what we repeatedly do. Excellence, then, is not an act, but a habit.”

Aristotle

The tie that binds a world-class operational system together is management behavior. Actions and behaviors of managers show employees what is valued and what will constitute success. As always, actions speak louder than words.

If a leader reinforces standards and processes that are in place to ensure long-term success, then employees will respond. But if a leader recognizes last-minute heroics for pulling an area out of a jam that could have been and should have been avoided, quite a different message is delivered and understood.

Leaders should always think, speak, and act with the Plan – Do – Check – Act cycle clearly in mind. This means in daily work, in projects, while delivering on expectations, when consultants are employed for any reason, and the list goes on. Management systems and routines should be constructed and analyzed using this simple, time-honored cycle.

4.1 Standardized Work

Standard work not only needs to exist in order to have true improvement, but when implemented correctly, standard work actually makes improvement happen by illuminating problems with the standard and making them visible for all to see.

“Where there is no standard, there can be no kaizen.”

Taiichi Ohno

When standard work does not exist, or is not repeatable, management has hidden problems waiting to surface. Managers unwittingly have multiple processes to manage where they believe there is only one. Variation in the standard method causes management and engineers to have to manage, identify, and solve problems in many processes where only one process should exist.

By creating an environment for rigorous discipline to standards, employees may analyze when the standard does not work and improve the standard without creating hidden variation that causes anomalous events.

XCELLUS utilizes a time-proven Job Instruction training process to create, manage, and train standardized work to front-line employees.

Additionally, leader standard work includes follow up and support of systems and processes vital to future success.

4.2 Illuminate Problems

The goal for the Visual Workplace is simple, to make everything (especially unacceptable conditions) as visual and visible as possible. A Visual Workplace includes any visual method for making everything in a business obvious to the casual observer: current work, if the work is ahead or behind
schedule, problems are immediately illuminated, locations exist indicating where and how much belongs there, and anything else that makes the invisible or non-visual become visible and visual.

4.3 **Kaizen**

Kaizen is one of two major improvement engines in a world-class workplace; Kaizen drives out waste and transforms the workplace utilizing ideas from those closest to the work. Those closest to the work are most frequently impacted by problems with the work itself and, therefore, are in the best position to correct and improve it.

Kaizen ideas are typically divided into two types, **Just Go Do** and potential **Project**. Project ideas should go to a project database for scoring and prioritization in context with other projects. Just Go Do’s are added to the team Action Register and implemented by the team.

Kaizen is not an event; Kaizen is continual, incremental improvement. Improvement projects, workshops and events can be a useful component of any program, but achieving daily team member improvement is the nirvana organizations should achieve.

In order for success to become routine, management must support the process and follow up daily with standardized routines. Management is also the primary coach in the Kaizen process, and helps drive employees both to participate on improvement teams and to submit ideas that improve their own work that they themselves can implement.

4.4 **Effective Root Cause Analysis**

Whenever an abnormal significant event occurs in any business area, an effective RCA should always follow.

There are many effective methods available for identifying root cause and eliminating it to prevent recurrence. What really matters is the management expectation that RCA and corrective action will take place and that management has a systematic way of supporting and following up on the process.

4.5 **Periodic Performance Reviews**

> “However beautiful the strategy, you should occasionally look at the results.”
> -Winston Churchill

Everywhere within the organization, periodically, teams should review progress toward objective attainment and validate the strategies for continued relevance.

The main reason to have the periodic reviews is so that management is not distracted by daily randomness and discrete numeric values. It is important to review trends, identify potential problems and proactively deal with them before a surprise comes too late to respond in a meaningful way.

Sometimes a change in tack is needed to ensure success or avoid disaster, but if it is not seen in time course correction could have limited results.

4.6 **Administration & Support Group Waste Reduction**

Some of the least analyzed or improved areas in any organization are in the administrative and support processes that help the business accomplish the mission.
In an ideal, perfect organization, only the ones making product or providing the purchased service need to exist. In reality, all other functions are needed (Sales, Marketing, HR, etc.). All functions should be continuously improving so the business does not make the costly mistake of allowing support functions to grow their departments unchecked or destroy value through misguided projects and pursuits that have nothing to do with decreasing the time it takes to convert customer desire into customer delight.

“\textit{We have met the enemy and he is us.} “

-Pogo

Every business should have a strategy to systematically reduce wasteful processes and practices in administrative and support functions. Every functional director should have annual waste reduction and cycle-time improvement objectives as criteria for their variable compensation.

XCELLUS helps put support functions on the path to systemic improvement as well as the daily problem solving and improvement processes.

5 QUALITY

When times become difficult for a company, whether because of global economies or competition, every company develops absolute clarity about what is truly important – the customer.

Highest quality products and services delivered when wanted and at the lowest possible cost is what the customer expects. Consistently exceeding customer expectations creates delight and customer loyalty. Meeting customer expectations creates satisfaction, but does not create loyalty.

Loyal customers are long-term sources of revenue; satisfied customers are sources of revenue today, but who knows about tomorrow? You are probably perfectly satisfied with the gas station you regularly use. However, this satisfaction will not stop you from using the gas station across the street if their prices suddenly drop 10¢ lower and stay there (and that won’t keep you loyal to them either).

Quality, not to be confused with grade, implies defect free products and services. Defects occur as a result of process variation. Defects may result in defective product or services, but will always result in not meeting customer expectations. Not meeting customer expectations will cause them to look for alternative companies. Once the customer has started looking for a replacement company, the customer is almost certainly lost as soon as it’s convenient for them.

There are many things that may cause process variation. Not all variation is created equal, though. The workforce absolutely must understand the difference in the two main variation types (common cause and special cause) and know how to respond to both. Only through proper response to variation can a company sustain the ability to continually improve processes and prevent problem recurrence.

XCELLUS facilitates the learning process and helps develop simple systems to support appropriate problem-solving routines for both types of variation.
6  DIRECT LABOR – THE MOST PIECES PER PERSON PER DAY POSSIBLE

Determination of direct labor requirements for the manufacture of product or maintenance activities can be a challenging task. Many companies only know what the historical cost was and use that as an estimate of what it will be in the future minus some improvement expectation.

Where appropriate, XCELLUS utilizes Maynard Operation Sequence Technique (MOST) for standard labor determination. MOST has deep roots in history and is the best method for scientifically determining the labor requirements of any manual job.

MOST is a Predetermined Motion Time System (PMTS) that has evolved over time to the current model, released in 1972. The evolution began in the early 1900’s with Fredrick Winslow Taylor, famous for time studies and scientific management, and Frank and Lillian Gilbreth, experts in motion studies. Methods Time Measurement (MTM), released to the world in 1948 by Maynard, et al, combined the two to produce time-motion analysis. MOST is a simpler form of MTM that is easier to use and apply by more people.

The three major advantages for using MOST to measure manual operations for sequence and timing are:

1. MOST develops detailed sequencing for constructing standard work, the foundation of every World-Class Production System.
2. MOST does not require long and detailed time studies, because it is based on scientifically derived standards using statistical analysis of a large database of measures. MOST can be applied in a fraction of the time it takes to perform traditional time study or other predetermined motion time systems
3. Since MOST is scientifically derived, it is well accepted all over the world for the development of worker standards and times to complete manual operations. MOST eliminates the subjectivity involved in performance rating an activity since the MOST technique is based on the average amount of time it takes the average person working at an average rate to safely perform a task, or series of motions.

If you are not using a scientific method for determining the direct labor requirements, exactly how do you know the correct standard labor requirements per piece?
A critical focus area for every business must be project management. Projects are the method companies typically change the way things are done, whether a capital project or an improvement project.

Projects are a company’s primary vehicle of change, yet many do not have well-developed project management models, systems and methodologies.

Areas of project management that often suffer are planning and risk management. Companies are too often surprised by issues that should have been identified and managed as risk. Once risk becomes reality it is an issue that must be reacted to for project recovery to happen. It is almost always better to identify, analyze and respond to risk than to wait and be surprised by an issue occurrence. A goal for organizations should be to become more proactive than reactive.

XCELLUS follows the Project Management Institute’s guidelines. When needed, we work with customer organizations to develop repeatable project management models that meld with existing project processes, such as change management, and organization-specific and industry-specific nuances that eliminate the possibility of a cookie-cutter implementation. Our risk and issue escalation models can be integrated into any existing risk response and issue recovery processes.
8 Risk and Issue Management

Managing risks and issues effectively is a key component of any robust operational management system. Businesses usually have ways of managing risks (e.g. policies, procedures, protocols) and issues (e.g. corrective actions).

Before risks are managed, everyone must understand the difference between RISKS and ISSUES. Risk can be thought of like Swimming with Sharks. The potential is there for a problem. The types of sharks, their hunger level, is the swimmer injured or impaired, etc., all affect the risk severity and likelihood. An Issue can be thought of as being bitten by a shark. It is no longer a risk, it has occurred and the next step is to take appropriate action to solve the problem.

Risks can be avoided, transferred (e.g. to an outside source), mitigated through action, and even accepted. The majority of the Risk Management System deals with risks that need mitigation.

When dealing with Risk, every company needs a framework for identifying and reviewing risks, and managing risks.

**Risk Management Model**

- **Plan/Define**
- **Assess (Identify & Analyze)**
- **Apply Risk Response Plan**
- **Communicate/Track/ Monitor/Control**
- **Evaluate**

**Risk Response Plan**

**Issue Management Model**

- **Issue Occurs**
- **Root Cause Analysis**
- **Corrective Action Plan**
- **Solve Issues**
- **Risk of Recurrence?**

**Issue Return to Green Plan**
Risk and Issue Management does not have to be complicated. Every employee should be expected to address risks as part of daily work and attack issues with scientific problem solving. XCELLUS ensures there is a robust Risk and Issue Management System in place that can be utilized and maintained locally indefinitely.

9 Training & Education

Personnel development is crucial to maintain an engaged, stimulated workforce. Money spent on training can be well spent or wasted depending on circumstances surrounding training. For training that is held internally and mandated, the most important thing to ensure training money is not wasted is to expect different behavior as a result of training and follow up to make certain the new behavior is realized.

One way education is always beneficial and worth every penny is education that is pursued by the individual on their own time. Pursuit of advanced degrees on personal time should be encouraged and always reimbursed regardless of subject as long as acceptable course grades are achieved. Even college courses completely outside chosen fields and unrelated to the person’s job should be reimbursed by the company, for example, an engineer enjoying a fine arts course in the evenings.

Training on the job should be supported when personnel pursue training related to their job, within reason.

Leaders are often left out of periodic training cycles, but this is a mistake. Leaders need regular training and development coaching to hone their skills and prepare them for the next assignment. XCELLUS works with leaders to create their personal development plans, which integrate Servant Leadership and Leaders are Teachers models. We also have many training and development programs to support all the components of the business system described within.
10 TPM, MAINTENANCE, & RELIABILITY

The primary objective of Maintenance and Reliability is to ensure company assets are available and perform as required at minimal cost.

**Availability is “The probability that an asset is capable of performing its intended function satisfactorily, when needed.”**

-Ramesh Gulati, Maintenance and Reliability Best Practices

Maintenance is, perhaps, the most overlooked and underappreciated yet necessary function in a production environment. The capacity to produce is highly dependent on equipment reliability, the ability to prevent breakdowns, and the ability to get equipment running properly once failure occurs.

At one extreme there is 100% reactive maintenance where the tyranny of run-to-failure rules. At the other there is 0% reactive maintenance. Neither is likely to be a cost-effective strategy.

It is the responsibility of Maintenance and Reliability personnel to develop the most cost effective strategies for their business. This cannot be determined from a book or heuristics; they must be determined using data analysis and built-in improvement processes.

10.1 PM Optimization

Preventive Maintenance (PM) is a fundamental and strategically developed program designed to reduce the probability that assets will fail prematurely. PMs should increase production capacity.

PMs should identify corrective maintenance and generate additional work. If, on average, 100 hours of PMs are not generating in the neighborhood of 50-100 hours of corrective work, then the PM cycles may be too frequent. PMs often are an outcome of Failure Modes & Effects Analysis (FMEA) and Risk Management.

10.2 Total Productive Maintenance (TPM)

TPM is operator based and leverages the abilities of those closest to the equipment to inspect, detect and correct potential failures. Operators are closest to the assets and usually know how they perform better than anyone.

TPM is a program designed to engage the operator as the maintenance first line of defense.

10.3 Condition-Based Maintenance / Predictive Maintenance

Condition-Based Maintenance (CBM), which is also known as Predictive Maintenance (PdM), is the process of evaluating the condition of equipment through periodic or continuous monitoring. CBM is generally accomplished while the asset is operating.

Most Maintenance and Reliability groups should have CBM technologies on critical, constraint assets as appropriate to reduce run-to-failure events.

10.4 Equipment Reliability

Reliability teams, including reliability engineers, should have one primary metric, Mean Production Between Failures (MPBF). Regardless of the techniques or technologies employed, the results must be longer running time available to Operations to produce product.
11 BENCHMARKING

Benchmarking can be used as a way to understand business competition and to see the possibilities, not as a measuring stick for operational excellence. It is not a good method for determining what your business should be doing.

“If ignorant both of your enemy and yourself, you are certain to be in peril.”

-Sun Tzu

XCELLUS uses benchmarks as a way of determining progress toward the ideal or potential future state. We never use benchmarking as a method for copying artifacts from one organization for implementation in another.

12 CONCLUSION

XCELLUS provides the roadmap for future success that will endure for years and establishes the foundation for cultural adaptivity to ever-changing global business conditions. We do not implement a canned solution in search of a problem or tools in search of a root cause, because this does nothing for sustained competitive advantage in the marketplace.

Only through the internal development of the management competencies and organizational capabilities described within can a company hope to become a world-class organization and remain one indefinitely.