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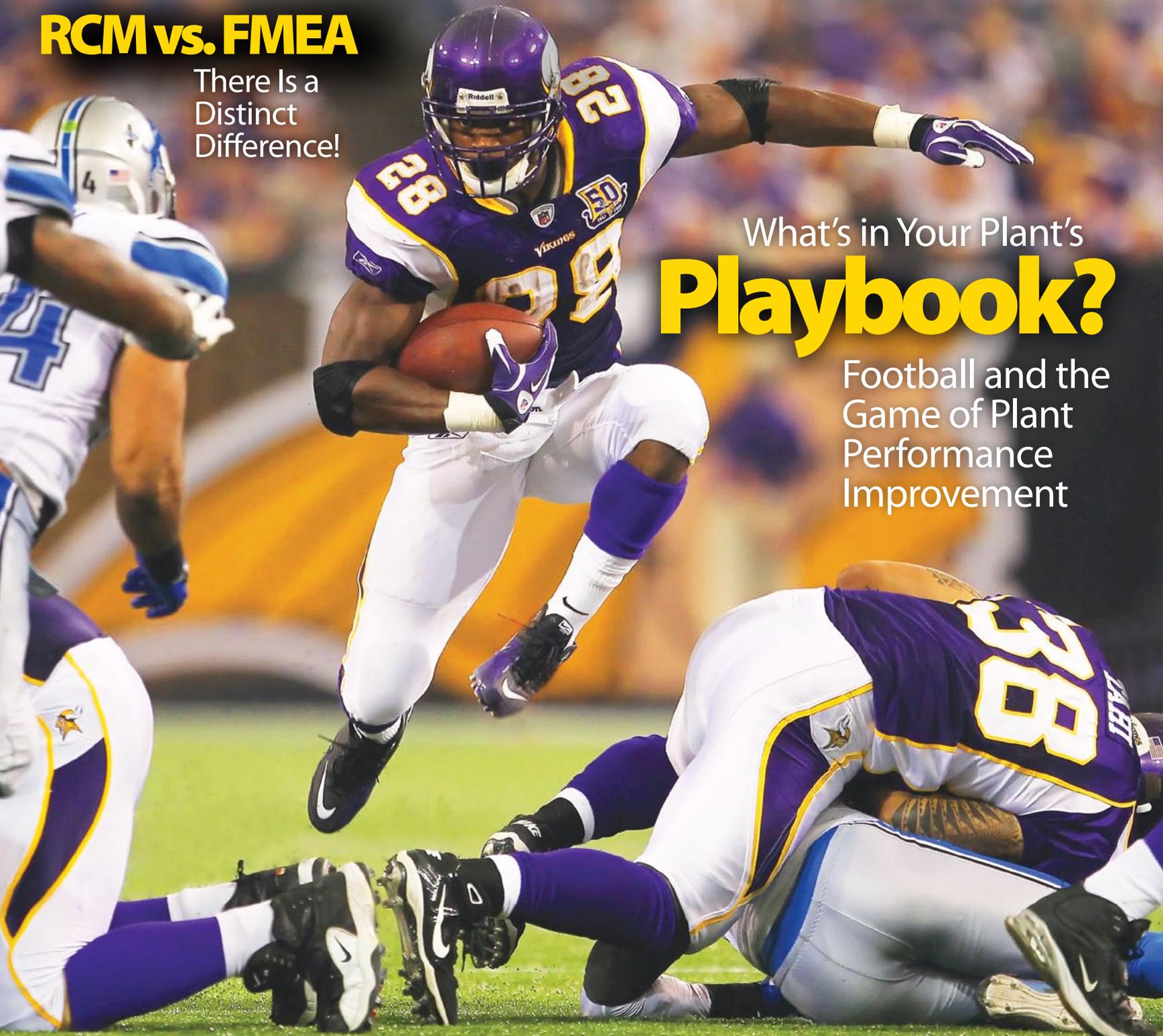
the magazine for maintenance reliability professionals

RCM vs. FMEA

There Is a
Distinct
Difference!

What's in Your Plant's Playbook?

Football and the
Game of Plant
Performance
Improvement

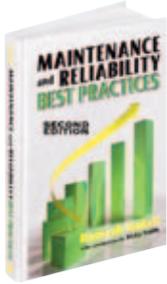




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#1 IN MAINTENANCE AND RELIABILITY!

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MAINTENANCE AND RELIABILITY BEST PRACTICES, SECOND EDITION

Ramesh Gulati 2012, 400 pages, Illus., ISBN 978-0-8311-3434-1, \$49.95

The first edition of this award-winning book immediately became one of the most widely read texts by maintenance, reliability, operations, and safety professionals. In the brief time since its publication, this book has become a must-have guide and reference for everyone who wants to ensure that their organization's assets are operating as and when needed and at reasonable cost.

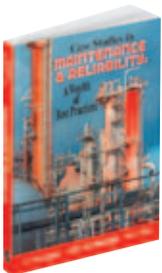
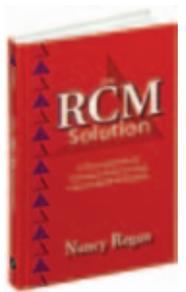
Features: Includes a list of questions and answers in most chapters which provide possible real-world scenarios. ♦ Features a streamlined flow for easier study and reference. ♦ Includes self-assessment questions at the end of each chapter. ♦ One of the first books to discuss asset management related standards, including the new ISO-55000 Asset Management Standards. ♦ Provides new material on corrosion control, risk management, and operator-driven reliability. ♦ A separate Workbook (ISBN 9780831134358) has

been prepared with the assistance of Christopher Mears.

THE RCM SOLUTION A PRACTICAL GUIDE TO STARTING AND MAINTAINING A SUCCESSFUL RCM PROGRAM

Nancy Regan 2012, 256 pages, Illus., ISBN 978-0-8311-3424-2, \$49.95

This is a straightforward, no-nonsense presentation of what RCM is and how it can be applied to maximize the productivity and safety of physical assets. It introduces and thoroughly embraces the proven power of RCM's basic principles and follows a common-sense and practical approach to implementation. A significant portion of this book is dedicated to SAE JA1011-compliant RCM. Yet, the author also introduces other asset management processes that embody RCM principles when the full rigor of RCM isn't warranted. This book thus provides a total solution for implementing RCM in any organization. Also, college instructors teaching reliability engineering will find this book a useful complement to their primary text.



CASE STUDIES IN MAINTENANCE AND RELIABILITY A WEALTH OF BEST PRACTICES

V. Narayan, J.W. Wardhaugh, M.E. Das 2012, 360 pages, Illus., ISBN 978-0-8311-0221-0, \$49.95

The authors describe 42 on-the-job events or situations - case studies, taken from their own work experience and from which they gained invaluable insights into a wealth of best practices in maintenance and reliability. In many instances they did not know the underlying academic theories that would have applied, and found solutions often more by intuition and teamwork. The case studies are real stories, told by real people, who were physically and emotionally involved. The events are captured warts and all, and the authors have resisted the temptation to offer a set of recipes for all occasions. Rather, the approach is all about 'how we did it' rather than 'how you must do it'. Stories are a great way to communicate, and that is the medium the authors have adopted, packing their

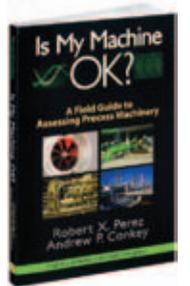
book with common sense practical ideas on how to improve maintenance and reliability performance.

IS MY MACHINE OK? A FIELD GUIDE TO ASSESSING PROCESS MACHINERY

Robert X. Perez and Andrew P. Conkey 2012, 300 pages, Illus., ISBN 978-0-8311-3440-2, \$29.95

This handy guide for assessing the potential risk of failure offers a solid basis for reliable and safe machinery operation. Combining the most commonly used assessment tools into one source, it is meant to be taken into the field by operators, plant supervisors, maintenance personnel, and reliability professionals in order to make informed decisions about their equipment.

Features: The only reference available that assembles a body of sound operating practices. ♦ Includes guidelines for gauging machine maladies, such as vibration and pulsation. ♦ Provides guidelines for key machine factors, such as lubrication condition, temperature limits, alignment, and balance standards. ♦ Presents numerous relevant examples within each section aimed at helping readers understand the proper application of the various assessment methodologies.



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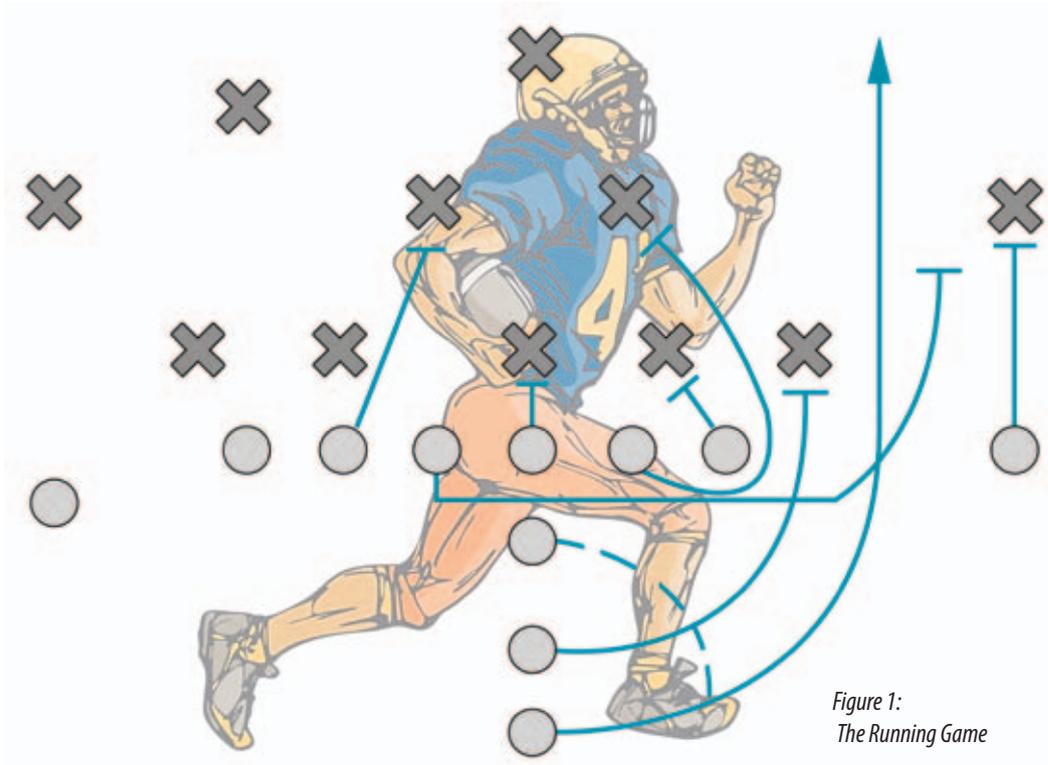


Figure 1:
The Running Game

Plant Excellence

Playbook

Sustainable Change in Less Than 180 Days

Tim Goshert and Darrin Wikoff

Football and the game of plant performance improvement are similar in many ways. In football, there are four quarters in which the game is played, just like the four fiscal quarters of business. The only score that matters is the one that stands at the last second of the fourth quarter.

In both football and business improvement, a unified team is focused on overcoming losses and making gains towards a predetermined goal. The team, in both arenas, is organized and driven by offensive and defensive game plans aimed at creating a significant competitive advantage. In order to have success on the field, both football and plant performance improvement require discipline, self-sacrifice, dedication, and perseverance.

In this article, Tim Goshert and Darrin Wikoff take us through the fundamentals of both the offensive and defensive game plans necessary for successful overall plant performance improvement.

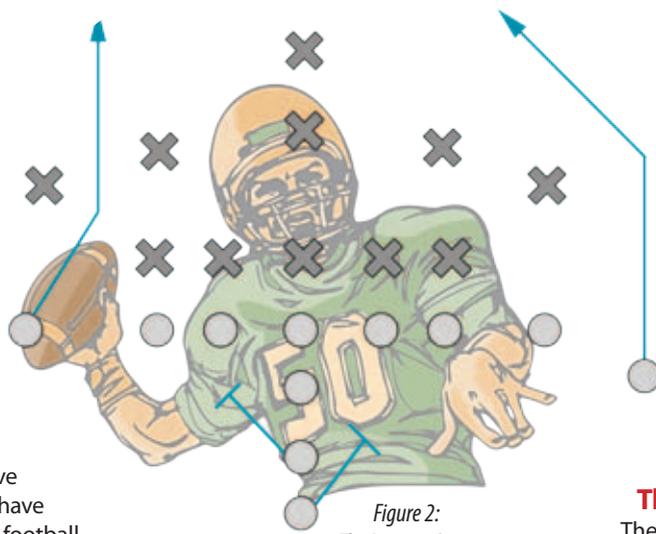


Figure 2:
The Passing Game

cesses ensure that current assets in the facility match the operational database's (enterprise asset management system) organizational hierarchy. Equipment criticality assessment processes provide an organization with a view and framework for knowing how critical a certain piece of equipment is to business performance. Failure mode analysis dissects possible failure modes of this equipment and outlines consequences to the business. All of the above processes are used by the organization to develop an EMP, which fully describes the proper maintenance strategy or plan to maintain the equipment in a manner that meets business requirements.

The Passing Game

The passing game in football is designed to gain significant yardage on each play. Short screen passes, post pattern passes, and over the middle passes all try to gain five plus yards per play. These are quick small activities to give the team a lot of yardage and leverage.

In plant performance improvement, several activities provide significant long-term gain, such as Reliability Centered Maintenance (RCM) analysis, Root Cause Analysis (RCA) and Condition Based Monitoring (CBM) tools. RCM analysis processes focus on understanding critical equipment failure modes and their consequences and mitigating actions to prevent failure. RCA focuses on past failures that have occurred and analyzes these events so the organization can understand and implement solutions to prevent reoccurrence. CBM processes provide surveillance activities for understanding the asset's current health and recommend actions to maintain and improve asset health. These processes focus on proactive activities that identify and provide solutions to short-term and long-term problems that inhibit production, quality, safety, environmental, and cost performance. These activities all provide the organization with solutions that eliminate process and equipment failures in the future. The focus is on elimination of defects and areas of waste.

Offensive Game Plan

Offensive Coach - Tim Goshert

The football offensive game plan is designed to score touchdowns against your opponent. This offensive game plan is built to capitalize on your team's strengths that will exploit your opponent's defensive weaknesses. It consists of a mixture of running and passing plays in sequence to move the ball down the field to eventually score a touchdown.

The offensive game plan in plant performance improvement has similar plays. The objective of scoring a touchdown in plant performance is to improve asset reliability, product quality, and customer service as an organization in order to optimize operational and maintenance costs within your organization. Several aspects of an offensive game plan will be outlined further in this article.

The Running Game

The running game in football is best described by former head coach Woody Hayes of the Ohio State University, who preferred an offensive style of play as "three yards and a cloud of dust." This area of the game focuses on blocking and overcoming your opponent with pure power and strength. Traditionally, it has been said that the running game is the activity that sets up all further plays in football.

In an operations, reliability, and maintenance improvement process, the running game equates to completing the required foundational work processes needed to support future reliability and maintenance processes. Some examples of these critical foundational areas are asset identification, criticality assessment, equipment failure mode analysis, and Equipment Maintenance Plans (EMP) based on failure mode analysis work.

These four fundamental areas are critical for supporting much of the future work processes. Asset identification pro-

Third-Down Conversions

In football, the offense's third down conversion requires a team to execute under pressure in a precise manner. This play is a critical point in which the offensive must gain the needed yardage to "move the chains" and get the opportunity for four more offensive plays.

In plant performance improvement, precision execution is also required. Two of the most important areas are in lubrication and work execution by the craftspeople. Lubrication requires that the five Rs are executed. They are the right lubricant in the right amount at the right lubrication point at the right time using the right procedures. Attention

to detail is important in application and contamination control. Work execution procedures by craftspeople require precision balance, precision alignment, and precision tolerance procedures in all applications. These procedures enhance and help ensure equipment reliability and performance.

Red Zone Offensive

The objective to any red zone offensive is to score a touchdown. We want to score seven

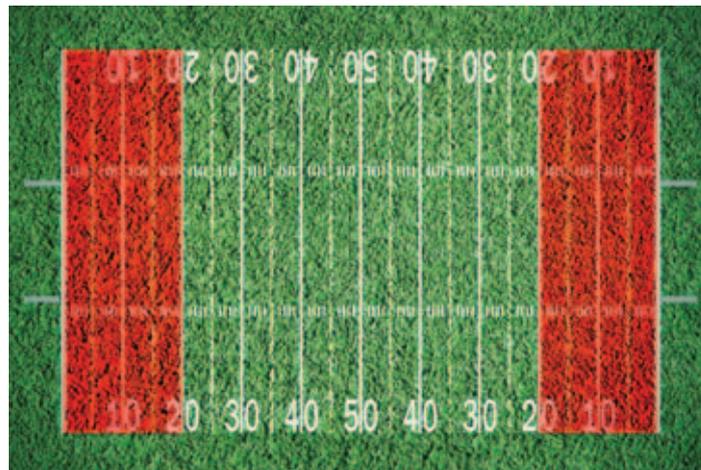


Figure 3: The Red Zone

points in every opportunity in the red zone. Football games are won and lost in the difference between scoring red zone touchdowns and settling for red zone field goals. The winners score touchdowns.

As in football, the wins or losses of your plant performance improvement process is based on how well you execute the right work. Work management processes need to be designed, agreed upon, and followed by the organization to enable work to be performed effectively and efficiently. All of the proactive efforts (EMP development, RCM, RCA, CBM, and Preventive Maintenance (PM) job plans development) that the organization completes in preparation for work execution allow the right work to be completed. Work planning, work scheduling, and work coordination activities prepare for the work to be done in an efficient manner. Fully trained craftspeople in precision techniques allow the work to be completed in a quality manner. Work execution is where the organization reaps the benefits of improved operational performance, increased equipment uptime, better quality products, and an optimized operational cost.

The offensive game plan described can allow your organization to succeed and win in improving plant operational performance. However, as in football, an offensive team requires a defensive team to have a winning game plan. Next is a description of a winning defensive game plan for your organization.

"Set goals - high goals for you and your organization. When your organization has a goal to shoot for, you create teamwork, people working for a common good." — Bear Bryant

Defensive Game Plan

Defensive Coach - Darrin Wikoff

In the context of overall plant performance improvement, the defensive game plan is one of risk management. Vince Lombardi, the legendary coach of the Green Bay Packers, once said, "If it doesn't matter who wins or loses, then why do they keep score?" I take this to mean that if we're not focused on achieving a better, more competitive outcome, then why play the improvement game at all? Of course it's about winning! The reason your company has decided to embark on a maintenance, reliability, or operations improvement journey is because they want to beat the competition and win the game of who can get the most customers. This requires a focus on defending against the opposition, and specifically, their impact on your team's ability to win.

There are many risks on the performance improvement field of play, too many for players to see during the game. Therefore, leadership, like coaches on the sidelines, must anticipate the opposition's every move and deploy a game plan that fills the gaps, crashes the corners, and effectively covers players downfield who have the ability to undo the gains made by the offensive game plan.

There are a number of defensive formations used in football. As the opposition's game plan is revealed, defensive coordinators must deploy a

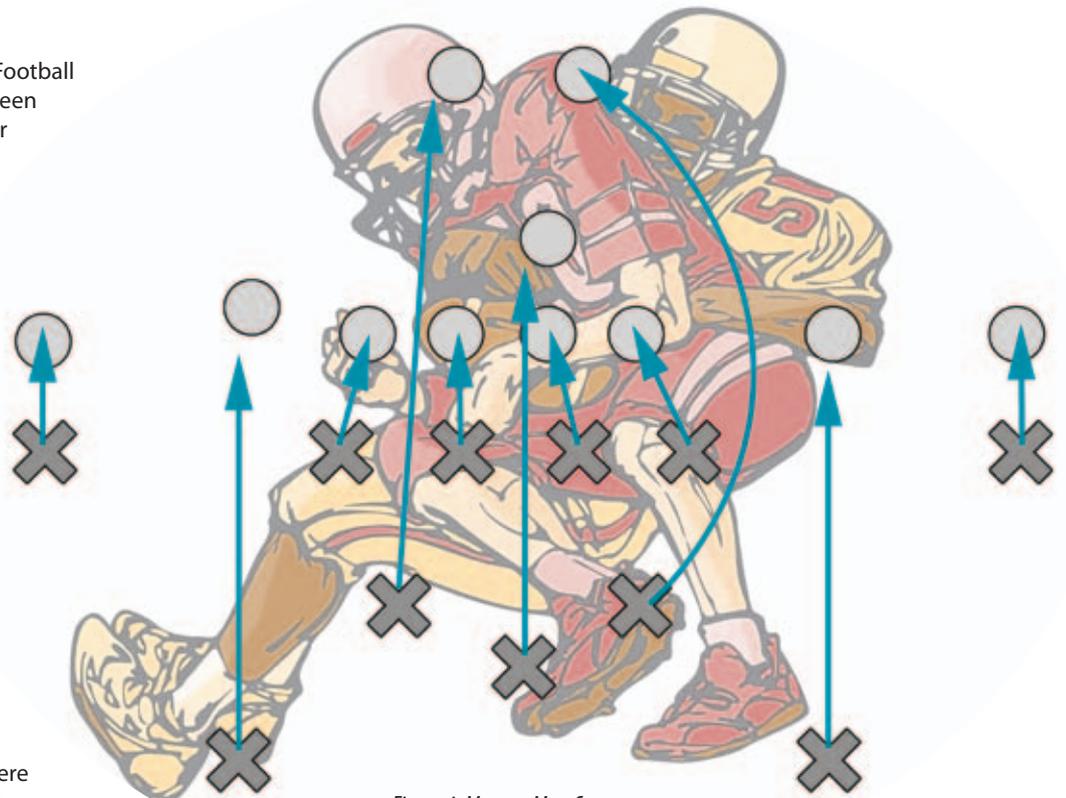


Figure 4: Man-to-Man Coverage
"Get the winners in the game." --Bear Bryant

package that stops the opposition from improving their position. The same is true in the performance improvement arena. As change risks become evident, coaches and project coordinators must be able to reach into the defensive playbook and call the right countermeasure. There's no time to waste, only seconds on the clock, and if the defense isn't ready, the opposition will score and make it harder for your team to win the game.

Man-to-Man Coverage

The first defensive formation that must be in every playbook is man-to-man coverage. This formation is the most aggressive because it requires a member of the improvement team to guard or defend against a key, influential player on the opposition. Defensive coordinators should deploy man-to-man coverage in the early stages of the game to build awareness of why the improvements being made by the offense are necessary and how they will impact employees. This formation proactively prevents resistance in the trenches.

Resistance, although a risk to the offense's success, is a very natural part of the individual change process. In this context, resistance refers to individuals who are actively heading in a direction that could negatively impact the result the offensive team is trying to achieve. Opposing, resistant formations would include people working outside established standards, people talking openly and negatively about the necessity of the change, or people simply refusing, passively, to execute new practices. Peter Senge, Senior Lecturer in Leadership and Sustainability at the MIT Sloan School of Management and author of the book, *The Fifth Discipline: The Art & Practice of the Learning Organization*, says that "people don't resist change, they resist being [forced to] change." For most people, resistance stems from a feeling that change is being forced upon them without considering their input, experience, or abilities to execute the change. As a result, your defensive playbook must find a way to engage them and capture their concerns, fears, and ideas.

The defense's objective in man-to-man coverage is to create a desire to accept and embrace the change. This is accomplished when those ac-

tively involved in the change seek out one or two people from within their natural circle of influence to communicate why the change is happening and how it will benefit them in their role or personal life. In this formation, each member of the improvement team assumes an advocate position. The position requires team members to keep an eye on their opposing counterpart and read the signs that indicate the individual has not yet accepted the change. Once the potential for resistance has been identified, the player must close the gap or intercept the route and reinforce the change through their relationship with the individual.

Zone Coverage

Zone coverage is a less aggressive, but very effective and necessary defensive formation. Zone coverage allows the defense to monitor several areas of the field while the players in the trenches are aggressively attacking the gaps. Typically, the zones needing to be covered on your "field of play" relate to the areas or functional departments impacted by the performance improvements deployed.

The objective of this formation is to oversee specific areas of the field and remove threats in each zone. Unlike man-to-man coverage that focuses on personal communication and relationships, zone coverage is more of a governance formation. Playmakers in this defensive formation are the area managers. These positions must have the ability to see what's going on in the trenches and make a positive play on the ball when these efforts come into their zone. Playmakers must be actively engaged in the play as it unfolds, carefully watching for a change in the expected outcome so they can adjust their coverage as necessary to prevent the opposition from gaining momentum.

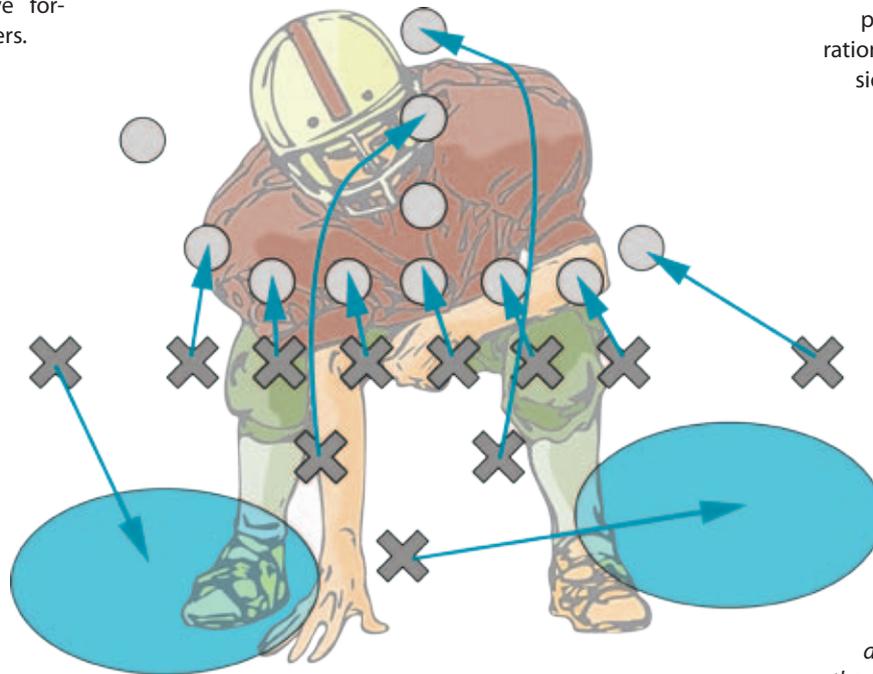


Figure 5: Zone Coverage

Goal Line Defense

The third and final formation that must be in place to ensure a short turnaround on your improvement investment is the goal line defense. The goal line defense formation is most commonly used in football to prevent the opposition from gaining small yardage, like in a third and short or goal line situation. In the performance improvement field of play, a goal line formation can help anchor the changes made by the improvement effort and prevent inefficiencies from impacting results short term. Near the end of the game, improvements have been executed, but employees are still perfecting their skills associated with the new practices. In short, mistakes are innocently made that may affect the overall outcome of your initiative. The goal line defense is there to prevent mistakes or ensure that these errors don't have an impact on the final score.

The playmakers in the goal line formation are a combination of on-field coaches and daily management systems. The objective of the field coaches

is to identify when a new practice is not yielding the right result and quickly diagnose if the problem is systemic or attributed to a training deficiency. The field coaches use indicators, similar to a defensive back watching how the opposing backs line up, to make adjustments to prevent a less than desirable result. Daily management systems, like visual controls and process performance indicators, help the field coaches read the play.

Conclusion

Unlike football, in the arena of performance improvement, you only get one chance at winning. Too many mistakes or missed opportunities and the season is over. Sustainable change is the result of both the offensive and defensive game plans being executed in collaboration. Focusing narrowly on any one side of the ball will only delay your return on investment and may even cost you the game. Teamwork is needed to achieve success. Business leaders, like coaches on the field of play, must ensure that the entire team understands the game plan and their specific role on the field and executes according to plan. Before you head onto the field, make time to walk through the game plan and prepare your team. Never forget: "How you respond to the challenge... will determine what you become after the game, whether you are a winner or a loser." - Lou Holtz



Timothy Goshert, CMRP, has 33 years of experience working in the food processing industry. He has extensive experience in plant operations management, project engineering, construction management, and maintenance & reliability management. In 2012, Tim retired from Cargill, Inc. and joined Allied Reliability Group as Principal. He is responsible for strategic customer account satisfaction and business development. www.gpallied.com



Darrin Wikoff, CMRP, is a Senior Instructor/Change Management Professional with Allied Reliability Group. For the past 10 years, he has continued to coach and mentor many of the world's industrial leaders through the rigorous process of implementing and managing reliability improvement initiatives in support of Operational Excellence. www.gpallied.com Darrin is the author of the book, *Centered on Excellence*, available at www.mro-zone.com

