



“Sharing Information to Improve Reliability”



## The Manager’s Shield

By Winston P. Ledet

In today’s production and manufacturing world, managers are responsible for safety, efficient operating and maintaining of facilities as well as keeping order in very complex organizations. While the evolution of technology has greatly enhanced our ability to control very powerful machinery, it has also vastly increased the need for technical skills to operate and maintain these advanced technologies. The large scale of these operations requires the combined effort of many people to insure that the machines continue to operate economically, safely and without interruptions.



Fifty years ago, it was not unusual to find foremen, supervisors, and managers who had enough experience running a facility to do many of the jobs of the people who reported to them. As machines, particularly control systems, have increased in sophistication, most managers would not be able to do the jobs of many of the people reporting to them. The complexity of operations and machinery today requires the combined efforts of everyone, a network of people with multiple skills and talents to insure that the machines continue to operate in a safe manner. This increase in complexity has created a different situation for managers. The manager is much more dependent on the workers to know how to operate the facility and how to make

repairs when malfunctions occur. Access to the collective know-how of a network of workers can serve as a shield to control the functioning of the machinery. This includes the knowledge and understanding of people in operations, maintenance, engineering, supply chain, contractors, vendors, etc.: anyone who touches the machines. In the past, a single person might have the experience to deal with the technology through his own experience and intelligence, but this is rarely the case today. Managers need to respect and trust their employees to understand, operate and improve their equipment, through the use of cross functional networks, formed by workers as part of their everyday work.

In the 1960s, Fred Emery and Eric Trist\* published a large body of work on the nature of what they called “socio-technical networks.” They theorized that people are the social part of the network and that machines are the technical part of the network. In their studies they recognized that work systems in the long wall coal mines of England required a different type of management system to coordinate the work that took place along a 750 foot long machine that stripped coal from an underground seam and conveyed it to trolley cars so it could be taken to the surface. This means of working was drastically different than the small

The Manager’s Shield...cont. on page 2

Rio Tinto Borax operates California’s largest open pit mine in Boron, California. The company supplies nearly half the world’s demand for refined borates, minerals essential to life and modern living. Borax traces its roots to California’s Death Valley, where borate deposits were discovered in 1872. The twenty mule teams were used by Borax to haul ore out of the remote desert.

Borates are an integral part of the natural world. Plants need borates to grow, and people need them also, not only as a nutritionally important part of their diet, but also as an essential ingredient in a dazzling array of the products used every day. Borates are important ingredients in a variety of household and commercial products, chief among them:

- insulation and textile fiberglass, flat screen TVs and heat-resistant glass
- detergents, soaps and personal care products
- ceramic and enamel frits and glazes, ceramic tile bodies
- agricultural micronutrients
- Other uses including wood treatments, polymer additives and pest control products

Rio Tinto Borax has been running Manufacturing Game workshops and many of the Action Team results have had some great results.

### BAP Scalper Screen APL

Receiving inaccurate parts for the scalper screen had been a reoccurring problem since the screen had been installed during a BAP

Rio Tinto Borax.. cont. on page 3

<b>What’s Inside?</b>	<b>The Manager’s Shield</b>	<b>1, 2–3</b>	<b>Rio Tinto Borax</b>	<b>1, 3</b>
	<b>Calendar</b>	<b>2</b>	<b>On the Hill</b>	<b>4</b>

## **SCHEDULE**

Throughout the year,  
**The Manufacturing Game®** holds  
workshops for the general public at  
universities and/or professional  
organizations.

For more information visit  
[www.mfg-game.com](http://www.mfg-game.com)

### **Public Workshop**

**The Manufacturing Game®** will be  
holding a Public Workshop at  
IMC 2011

Bonita Springs, Florida  
December 5, 2011

For more information or to register visit:  
[www.MaintenanceConference.com](http://www.MaintenanceConference.com)

### **Conferences of Interest**



**Houston Chapter of SMRP  
Maintenance and Reliability  
Symposium**  
Moody Gardens—Galveston, TX  
August 18-19, 2011

For more information or to register visit:  
[www.smrphouston.org](http://www.smrphouston.org)



**SMRP Annual Conference**  
Greensboro, NC  
October 17-20, 2011  
[www.smrp.org](http://www.smrp.org)



**IMC 2011**  
Bonita Springs, Florida  
December 5-9, 2011

For more information or to register visit:  
[www.MaintenanceConference.com](http://www.MaintenanceConference.com)

**Mark Your  
Calendar!**



### **The Manager's Shield..cont. from pg. 1**

crews of miners using picks, shovels, and wheelbarrows to move the coal from the seam to the trolley. They recognized that the social engagement within a crew was an important dynamic of getting the work done. Once they dispersed the crews to tend to the 750 foot long machine, the social nature of the crew dynamic was lost and the natural coordination of work that had existed within the crew was disrupted. Their early attempts to restore the social aspect to work focused on safety and health issues that previously were tended to by the crew dynamics. In the early days, when a miner was injured or killed the crew would financially provide for the family. This was the social part of the system, and at that point very little technical aspect existed since the equipment was hand tools. While the work group providing for the families of injured or killed men met the social needs, it did not address the technical issues of operating the machinery once the long wall equipment was introduced. Later research recognized that the technical aspect of the network required people to share their intelligence regarding the proper functioning of the machinery. This part of the socio-technical network was created by the bonding of people and connections of trust that occurred whenever they performed meaningful work together.

As machinery has grown more and more complex, the idea of solving problems with people from different functions emerged as a guiding principle for programs such as Total Productive Maintenance. These cross-functional teams formed to make improvements in the functioning of machines. They not only solved problems, but also created bonds between people based on the meaning they experienced in the process. These bonds then became connections of trust that people could use in the future to accomplish meaningful work together.

One might ask how the socio-technical network view of an

organization matters to a manager. In organizations that have strong socio-technical networks, the managers can call upon the network to not only solve problems but, better yet, to prevent the problems from occurring in the first place. That is what we are calling the manager's shield.

The next obvious question is: "If a strong socio-technical network is not present, how can one be created?" It is a manager's responsibility to make sure that the social networks that exist morph into one that also includes the equipment so that it becomes a socio-technical network as well. By encouraging cross functional action teams socio-technical network connections can be established.

John Kotter, a professor at Harvard, has studied management and leadership for many years and concludes that the person who is a manager plays two different roles. Sometimes he is a leader and other times he is a manager. When he is acting as a leader, he is making changes to his organization. When he is acting as a manager, he is creating order in his organization. A simple way to articulate the difference is in terms of the socio-technical network. Leadership is best described as the process of creating the socio-technical network while management uses the socio-technical network as a shield to protect the organization as the changes are made so that the changes

...cont. on page 3

**HOUSTON CHAPTER OF SMRP  
2011 MAINTENANCE & RELIABILITY  
SYMPOSIUM**  
August 18-19, 2011  
Moody Gardens — Galveston, TX  
Golf Tournament August 17, 2011



- Top notch speakers presenting on the 5 Pillars of SMRP
- Great opportunities for learning & networking

For information or to register visit:  
[www.smrphouston.org](http://www.smrphouston.org)

**The Manager's Shield...from pg. 2**  
 maximize the value to the organization by mitigating the risks involved. Leadership addresses the question "what types of changes are needed," and management addresses the question "what magnitude of change is needed?"

When we apply these insights to reliability in manufacturing organizations, based on our benchmarking and computer modeling, we make the following conclusions:

- The type of change needed is

defect elimination by cross-functional action teams.

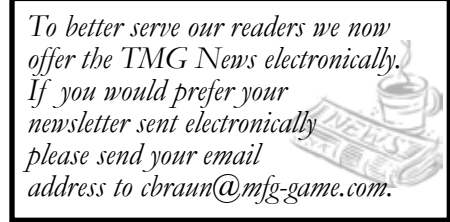
- The magnitude of change needed is one team per hundred work orders per year.
- The commitment needed to make the change is every worker participating in approximately four action teams per year in order to begin the process of change.

With a manager's shield effectively put in place, the possibilities for sustained culture change are endless.

Read more about the shadow network and the manager's shield

in our upcoming book "Level 5 Leadership at Work," the second book in the Heroic change series. It will be published later this year. Look for the first book in the series, "Don't Just Fix It, Improve It" on MRO-Zone.com and Amazon.com.

*\*http://www.sociotech.net/wiki/images/9/94/Evolution\_of\_socio\_technical\_systems.pdf*



**Rio Tinto Borax ...cont. from page 1**

Phase II expansion project at Rio Tinto Borax. The APL (Applications Parts List) did not reflect all the accurate stock code numbers, was missing some of the required parts for the equipment (such as the motor), and even listed some of the parts that were not used on this piece of equipment. This resulted in frustration for the maintenance personnel as the wrong parts were ordered and additional downtime was necessary while the correct parts were being hunted for during the breakdown event.

The Action Team of Dan Petroff, Jim Kaiser, Nick Smith, Dilliard Love, Ron Fox and Kevin Lumert with help from the BAP maintenance and operations personnel and the planning department obtained field measurements and parts information. The warehouse inventory for these parts was then reviewed for accuracy and stock numbers were assigned and the information was imported into the APL. Now when work needs to be done the correct parts are ordered and arrive so there is no additional downtime.

**Feed Belt Leak**

The 5 mol Packer Belt was leaking at the tail pulley. The cross functional Action Team of Ernesto Delgadillo, Clay Erickson, Mike Gifford, Danny Buckley, Tim Hargett and Jim Lank inspected the belt in the Tail Pulley area and determined

the cause of the leakage. They checked the speed of the belt and the tonnage to see if either had been changed, then met to discuss their findings. The leak was estimated to be about two tons per 24 hour shift and required an operator to climb up and shovel it off the deck each shift. The biggest trouble spot was the seal around the tail pulley shaft that came from the manufacturer. The team decided to fabricate a larger seal and that combined with some other sealing improvements drastically reduced the amount of spillage. Between the amount of 5 mol spilled and the labor to clean it up, it is estimated to be over \$100,000 in savings annually.

**Level Monitoring**

Monitoring the levels on the Atiscalant Tank had to be done manually and sometimes if not done often enough the tank would run dry requiring an acid wash of the tank. The Defect Elimination Team formed during a Manufacturing Game workshop of Simon Napolis, Earl Lewis, Saskia Duyvesteyn, Dennis Davies, Will Coronell and Ricky Beck decided to fix this defect by identifying the appropriate level control device, then placing a work order for adding an automated level monitor system and an alarm to the HM1. With the help of the electric shop the new automatic system is in place and now can be monitored from remote locations. The net annual savings is \$155,000.

**The Manufacturing Game® Public Workshop at IMC 2011**

How can you get your organization to be more proactive and deliver sustainable business performance? The Manufacturing Game Workshop is a catalyst that cultivates these organizational characteristics.

In this hands-on interactive experience participants learn the importance of cross communication between departments, strategize, and deal with solving everyday problems. They discover they can make improvements while still meeting customer demands in a safe and environmentally sound world.

This workshop is not only suitable for leaders responsible for creating a reliability culture, but for all positions. Front line workers, operations and maintenance staff will all gain valuable insight from this simulation.

Many of the 35,000 people from around the world who have played the Game have found it a transforming personal experience and have gone on to deliver both cultural changes and performance turnarounds in their organizations. Be the one to bring these insights into your company, attend The Manufacturing Game Public Workshop at IMC 2011 December 5, 2011. For more information or to sign up visit [www.maintenanceconference.com](http://www.maintenanceconference.com)





7702 FM 1960 East, Ste. 226  
Humble, TX 77346  
(281) 812-4148  
(281) 812-4149 Fax  
<http://www.ManufacturingGame.com>  
email: [info@ManufacturingGame.com](mailto:info@ManufacturingGame.com)



“Managing is not running,  
hitting, stealing.  
Managing is getting your  
players to put out 100  
percent year after year.”  
—Sparky Anderson

## Summer

### TMG News

#### **Stories From the Hill Clean & Dip**

In order to clean painting equipment CH2M Hill has always used paint thinner. Paint thinner presents certain safety hazards such as skin and eye irritation. Prolonged contact could cause respiratory, digestive and nervous system disorders.

It often took an employee 30 minutes to clean one paint gun, equating to 182 man hours per year. As a general rule approximately 8 paint guns had to be replaced because of the corrosive features of paint thinner for a cost of \$2,400.00 and the disposal cost of the hazardous waste was \$163.62.

Action Team members Brian Berkbigger, Will Berry and Ceaser Lopez found a product called Clean-N-Dip that is environmentally friendly. Not only is it an effective cleaner when sprayed through a paint gun and paint sprayer, but parts and guns can be soaked in the

liquid without any corrosion. Clean-N-Dip can be strained and reused over and over again. It is water based, non-flammable and will not corrode metals or pit aluminum. It contains no methylene-chloride, caustic or other harsh chemicals and easily cleans up with water.

With this different method of cleaning only 2.6 man hours per year are required as opposed to the 182 man hours required before. The implementation cost is only \$50 per 5 gallon container, and the product can also be used on other pieces of equipment that cannot be cleaned with paint thinner. The Action Team plans on sharing their success with others that can use this product.

#### **UV/IR Improved Test Lamps**

We often get so used to using the same and familiar tools, that we have used for years, that we don't think to look for tools that can be easier and safer to use. The UV/IR test lamps used in Alaska had become old and

unreliable. Mark Taylor, Joe Giannone, and Steve McCall took on themselves to investigate if there was a new, better model available. The old lamps weighed 15 pounds, had a test range of 1–3 feet and could only be used for UV testing. Someone had to stand on a ladder or build scaffolding and hold the 15 pound test lamp 30 seconds at arms length or use RAT Techs in order to test the UV/IR detectors. This could cause strains and there was always the danger of loss of balance and falling. The Action Team found a new test lamp that was lighter, only 5 pounds, and had a test range of 15–20 feet. It could also be used to test UV and/or IR, so it was multifunctional. In order to insure the availability of the test lamps they purchased two additional units to have on hand. The cost to implement = \$1,598. The savings reported in man hours and the elimination of building scaffolding and using RAT Techs = \$32,902. The increase in safety — priceless!