



“Sharing Information to Improve Reliability”



## BP Grangemouth Flushes Away A Persistent Defect

**The “Toilet Brush”:** Reduces  
“Off-Spec” 3% - 5% Valued At  
Over \$500,000 Annually

During an Operations Excellence workshop using The Manufacturing Game® at BP’s Grangemouth facility in Scotland, an Action Team took on a debilitating defect and eventually proved that often, the answer to a persistent and costly defect is a very simple solution.

The Action Team members, decided to use the vehicle of The Manufacturing Game Action Team to place some urgency on the problem of frequent blockages in the anti-oxidant powder feed system. The additive feed mixer mixes polyethylene powder with an anti-oxidant additive prior to extrusion. Blockages were occurring where the additive feed pipework joins the mixer casing. A component in the additive was melting when coming into contact with the high temperature of the polyethylene powder. Because of the design of the pipework system, there was no way of detecting a blockage until 40 minutes after it had occurred. At that point, the back up of powder in the pipework would start to interfere with the upstream feed system, which would trigger that something was wrong. This could allow up to 15 tons of “off spec” product to be produced into a 200 ton silo. Any good product already in the silo had to be downgraded along with the “off spec” product. The root cause of the problem was not clearly understood.

# Experience Is The Best Teacher: The Art of Storytelling

By Sherri Abshire

The Manufacturing Game® has been using the art of storytelling for many years now. Our philosophy is that story telling is a powerful way to transfer learning, increase motivation, encourage teamwork, and teach communication skills in order to lead change.

We believe that stories make points better than simply stating the facts themselves because if the story is really good, the person telling the story won’t have to state their point at all. The listener will listen to the story, think about what is being stated and figure out the point that is being made all on his own. The more the listener processes information on his own, the more he will understand the story and remember it. After all, human memory is story based. Howard Gartner, Harvard Professor, states, “A core competence of a five year old is the ability to tell a good story. It’s the only way we understand the value of things.”

*The four most  
important words  
in writing:*

*Once  
Upon  
a Time*

storytelling in meetings as a way of introducing a topic thus setting the tone and context as well as making it more interesting. Instructors incorporate storytelling activities into their programs in order to increase retention and build fun, consistent methods for improving the learning experience. And of course, speakers use stories as their most important tool by creating interest, clarifying concepts, and deepening the emotional impact.

A recent Booz Allen review concludes, “Perhaps the most powerful role of stories today is to ignite and drive changes in management policy and practices”.

Storytelling is in fact at the core of the significant activities of every modern corporation as well as at the center of everything we do in public and private life. An important leadership skill emerging in the business world today is the ability to tell the right story at the right time, and it is every executive’s job to make sense of the ever-changing business environment by using storytelling as a leadership tool.

Noel M. Tichy, a professor at the University of Michigan Business School and co-author of the Leadership Engine states “Leadership is about change. It’s about taking people from where they are now, to where they need to be. The best way to get people to venture into

### Telling Stories at Work

Throughout time, managers have used storytelling tools for coaching and mentoring of their own teams in order to build teamwork and stronger performing groups. Trainers have used storytelling in technical training, new hire orientations, leadership development, and team development. Facilitators use

continued on Page 2

continued on Page 3

### What’s Inside?

Experience Is The Best Teacher	1-2, 4	Public Workshop Calendar	2
BP Grangemouth Flushes Away a Persistent Defect	1, 3-4	What Doesn’t Work Is Doing Nothing At All	3

## Public Workshop Calendar

Throughout the year, The Manufacturing Game® holds workshops for the general public at various universities and/or professional organizations across the country. Contact us for dates.  
[www.ManufacturingGame.com](http://www.ManufacturingGame.com)

### Conferences of Interest



**Offshore Technology Conference**  
May 2-5, 2005  
Houston, TX

To register or for more information visit:  
[www.otcnet.org](http://www.otcnet.org)



## NPRA

**NPRA Maintenance Conference**  
May 24-27, 2005  
New Orleans, Louisiana

To register or for more information please visit:  
[www.npra.org/meetings/maintenance](http://www.npra.org/meetings/maintenance)



**Mark Your Calendars!**

continued from Page 1

unknown terrain is to make it desirable by taking them there in their imaginations". Peter Orton, who spent 15 years as a Hollywood script writer and story editor before enrolling at Stanford to write a PhD thesis on the effects of story structure on audiences states, "Humans are storytellers. Stories enhance attention, create anticipation, and increase retention. They provide a familiar set of 'hooks' that allow us to process the information so that we hang on them."

### The Power of Action Team Success Stories

Over the years, we have encouraged our clients to not only actively record results of their TMG workshop Action Teams, but more importantly, to record the results in story format. This allows them to use these success stories to reward the Action Team members in addition to sharing their successes with others within their own organization and throughout the industry. Our quarterly TMG newsletter has been a great tool for accomplishing this goal. We've developed a short 16-question survey based on Joseph Campbell's concept of a Hero's Journey. The survey is designed to facilitate the story writing process, and it guides the writer through the writing process. We provide this survey to our clients for their own use and even provide the story writing process of converting the survey answers into a story free of charge for those who wish to take advantage of it. Clients may opt to use the written story internally or share their success with others by approving it for publication in our quarterly TMG newsletter that is distributed throughout the industry. This story writing service is available to all our clients and is strictly confidential. (See the side bar on this page for the list of 16 questions in the survey, as it relates to writing about Action Team successes.)

### Telling Your Story

If you wish to tackle the process on your own, we stress that all good stories have a beginning, a middle and an end. So, before you begin to write, sit and think for a little while about the beginning, middle and end of your

## WHAT DEFECT DID YOU CHOOSE TO ELIMINATE?

### In the beginning of the journey:

1. On your action team, what was compelling you to eliminate this defect? (Why was it urgent to you?)
2. What was not functioning properly to cause the problem here?
3. What did you have to do to get this thing functioning properly again?
4. Who were the characters that played key roles in the drama that led to this improvement?
5. Were some of the characters skeptical that a solution could be found?

### In the middle of the journey:

6. After the early part of the work in identifying the problem, did you run into some obstacle that had to be resolved to continue? (What was the obstacle?)
7. Did this lead to some unique insight or discovery about your problems? (What was the insight?)
8. At this point in the journey did something new have to be created to proceed further? (What was that?)
9. Who was key in getting that done?
10. Was there something that had to be removed or gotten rid of or left behind to continue? (What was that?)
11. What benefit did you get from making this change or eliminating this defect?

### In the last stage of the journey:

12. Once the problem was solved, was there or is there some barrier we still have to cross to avoid losing the improvement we created at some time in the future? (What is/was that?)
13. Who was or is key to making the change to prevent this problem from coming back in the future?
14. What power do they need to make this change?
15. Is there something you learned in this journey that adds to your wisdom (i.e. a best practice) that you would like to pass on to others?
16. Is there something humorous that you came across in this journey that makes the best practices lessons learned very memorable?

story. Don't forget to include key factors such as the main set of characters, the problem, conflict to create interest, and a resolution. The survey form helps to organize this thought process.

Ready to begin writing? Start with the 16-question survey form, grab a pencil and paper, or open up a new file on your computer, and get started!

### The Secrets to Good Story Writing

- Set your mind free and have fun and be creative.
- Write your story all the way through before you edit it. Don't allow the edi-

continued on Page 4

The problem had existed for many months and on each blockage occasion, it took 3 operators 2 to 3 hours to stop the extruder, remove the blockage and start the plant up again. The work involved was dirty and messy and was causing the operators "all sorts of grief", not to mention dealing with the effects of the problem was diverting the operators' attention from keeping the rest of the plant running in a steady state. The operators felt that the hassle and time involved in rectifying the defect each time it occurred was not well understood by people outside the operations team.

The team faced plenty of difficulties in trying to resolve the issue partly because they were struggling to understand the root cause of the problem. Fortunately, they had the support and help of the entire Operations team. The technical team made many changes in an attempt to solve the problem, but the team was frustrated when none of these attempts were

successful in stopping the blockages.

As the problem worsened, product quality figures were taking a nosedive. Management introduced an edict that the extruder/mixer system was to be shut down every 24 hours to remove any build up from the pipework. Although this helped to reduce the amount of product being downgraded, it increased the pressure on the Operations team and exposed the team and the plant to other issues. It involved the regular starting and stopping of the extruder, increasing exposure to high temperatures, and causing manual handling hazards. The change could also impact extruder life, increase maintenance costs, and increase the risk of shutting the whole plant down if the extruder failed to start properly.

The real breakthrough came when the focus moved away from trying to prevent build up of the melted additive to finding an easier way to remove the build up while the machine was still

on-line. The winning idea, and one of the simplest, was a means to remove the partial build up without shutting the machine down. This led to the design of a unique mechanical paddle/scrapper fitted inside the pipework but operated by a valve handle on the outside of the feed system. After installation of this new paddle/scrapper, the extruder continued to be stopped on a regular basis to check that the scrapper was doing the job. Confidence in the new system grew quickly and has worked for many months with no blockages and no "off spec" product. Because access to the valve assembly for the new paddle scrapper is awkward and was not originally intended to be part of the plant design, the team continues to work on improvements. The present solution is also dependent on the discipline of the operations team in manually operating the scrapper several times each shift. While the affects of the problem are still fresh in people's mind, this is

continued on Page 4



## What Doesn't Work, Is Doing Nothing At All:

### Action Team Drastically Reduces Man Hours Spent Flushing Furnace Induction Coils

**D**uring a Manufacturing Game workshop at A-Carb in Kentucky in 2004, an Action Team was formed to improve the process of flushing sediment from furnace induction coils. Team members, Davey Jones - Maintenance Technician, Brad Jensen - TPM Leader and Gerald Ross - Operations Manager discussed ultimately eliminating the need to flush the coils at all, but decided in the meantime to make the process more user friendly and less time consuming.

In order to insure good cooling water flow through the coils of all induction furnaces, it is necessary to periodically flush the coils by reversing the flow of cooling water through the induction coil. Reversing the flow removes loose deposits in the coil. In order to do this, the maintenance technician is required to remove 9 hoses from the inlet manifold and 9 hoses from the outlet manifold and swap their positions to create a reverse flow. This cooling operation requires approximately 8 man-hours per coil resulting in production delays.

Davey Jones stated, "What doesn't work, is doing nothing at all". With the full support of Management and Engineering, the team resolved to find a

solution. After analyzing the process, it was obvious to the team what needed to be done to improve the process that no one had attempted to change over the last five years they had been flushing coils.

Davey, the key designer of the new system, made the installation on one coil as a test. This involved modifying the piping and valves at the cooling water inlet and outlet manifolds, and on the cooling water supply lines. The cooling water outlet was connected quickly to the cooling water supply system by means of an additional section of hose equipped with quick connections. The inlet side, which serves as an outlet when flow is reversed, was routed to a floor drain. The old method of flushing had never allowed anyone to see the water, and they were surprised to see that it was much dirtier than anyone expected. The sequence of the entire operation is controlled manually through the installation of ball valves at key points.

Once the test coil was equipped with the modification and its success was demonstrated, it was difficult to find the time to apply the fix to the remaining coils. The coils are in use for production several

weeks at a time and could only be modified during brief scheduled downtime.

Maintenance technicians traditionally spend a great deal of time answering radio calls. It is sometimes difficult for them to find the time to work on projects. The fact that A-Carb had decided to focus on shifting from the reactive "fire fighting" mode to the planned and predictive modes, the technicians were able to effectively complete the modifications.

The result of these modifications to the coil flushing process has reduced the amount of time spent flushing from 8 man-hours to 1 man-hour per coil. Production is no longer delayed while waiting for the coil to be flushed. The new method also represents a more thorough flushing, which they expect to lead to longer coil life.

The Action Team participants stated that this project made them realize how they walk past opportunities to make real improvements on a daily basis and never realized it until they took the time to take a really good look. All A-Carb employees are encouraging each other to actively find a better way to do their jobs so they can continue their defect elimination practices.



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



"TMG has helped the 'light come on' for many of us. The newsletter helps us keep it glowing." Thank you.

- David Bird, Continuous Improvement Leader, A-Carb, Walton, Kentucky -



## TMG News

### continued from Page 2

tor in you to dampen the spirit of the artist in you.

- Think about a story you like. What makes it good? Can you identify the main character, the setting, the problem and the resolution?
- Writing means rewriting. A first draft will never be your best effort. Write until you're satisfied with your story. Change and rewrite the story to make it stronger.
- Are you having fun? If so, that's great. If not, make it fun.
- Write about things you know.

The biggest secret to writing a good story: Practice, Practice, and Practice. Are you telling a great story? If you want to persuade people to change, get people to work together, share knowledge, communicate who you are, and lead people into the future, start storytelling!



### continued from Page 3

likely to be a satisfactory short-term solution. A means of powering the mechanism, to allow for remote and automatic operation, will remove any risk associated with the current procedures.

With the successful completion of this Action Team, team members are pleased to know that the work they did has saved the company over 3,000 manhours a year of operator time, saved over 200 manhours of maintenance time, and reduced maintenance and energy costs by over £40,000. Also, product reduced to "off spec" quality was reduced by 3% - 5%, valued at over \$500,000 annually. According to Graeme Pitcaithly, one of the key learnings from this experience was to not attempt to come up with a more technical solution than is necessary, but to do the simple things first. The



solution was innovative, simple, yet a low cost solution to a tiresome and expensive defect. In keeping with the simplicity of the proven solution, everyone at BP Grangemouth now knows the new paddle/scraper mechanism as the "toilet brush"!