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**A Tale of Two Organizational Processes;
Leading vs. Managing; Which is Best?
A 19-Year Case Study Shows the Way.
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Abstract

This case study contrasts a highly participative leadership approach called, Partner-Centered Leadership©, with the traditional top-down management approach showing how they affected a large chemical plant’s total performance, including safety. The data analyses show that Partner-Centered Leadership© resulted in superior, sustainable occupational safety, occupational health and process safety management performance while the traditional top-down management approach produced only passable results.

This case study uses the Total Recordable Case Injury Rare (TRC), as reported in the US OSHA Log, and the US EPA’s Toxic Release Inventory (TRI) report data to compare the effectiveness of these two leadership approaches. The case study covers 19 years of actual performance at the DuPont (Chemours since 2016) Belle Chemical Plant in Belle, WV.

Introduction

It is well known in the chemical, petrochemical and refining industries that everyone must focus on all three dimensions of safety; the occupational safety (e.g., slips, trips and falls), occupational health (e.g., repetitive motion and chronic exposures to hazardous substances) and process safety management (PSM) (e.g., process hazards reviews, incident reports, prevention of toxic releases, fires, explosions and total chemicals lost to the environment). All three of these areas must be managed and led with strong skills, high operating discipline, intensity and dedication. Each of these areas requires a different skill set and technical knowledge. In bringing all three of these together, the organization can achieve total safety excellence. Occupational safety and health are best managed by those who are close to and doing the actual, hands-on work (operations) while PSM is run by the engineers and upper management, with operations support, who make the technical decisions, allocate resources and decide what needs to be done.

Managership

Most organizations use a top-down management approach where the directives from management go down to the employees doing the work who are, then, expected to comply. Its

philosophy and practices are deeply connected with the 1911 work of Frederick Taylor¹, the Father of Scientific Management. Taylor's work led to many productivity improvements like vastly improving the productivity of Ford's production lines in the 1920s. Examples of consultants who are currently using this approach are John P. Kotter² (1995) who is working organizational change, and E. Scott Geller³ (2001) who is driving behavior-based safety.

Richard Knowles was well trained in this management approach when he first became a DuPont plant manager in 1980, but he became more and more dissatisfied with the average results that were achieved and the harsh ways he was expected to drive and treat the people. He began exploring other, more effective and humane ways of leading. In 1987 he became aware of chaos theory and began to explore the implications of this non-linear science on leadership⁴. He had also read Jack Gibbs' 1978 book, *Trust, A New Version of Human Relationships for Business*⁵, and Warren Bennis' 1989 book, *On Becoming a Leader* which helped him develop his thinking about leadership⁶.

During this period, he also studied the work of John G. Bennett who taught about the deeper, hidden patterns and processes going on around us as we interact with other people. Bennett called his work Systematics⁷.

Becoming a Leader

These ideas and insights led Knowles to begin to change the way he led. He began walking in the plant for about 4-5 hours a day, every day, having focused, respectful conversations with the people. Everyone learned to listen to each other and learn together. Positive changes like reduced injury rates, lower emissions, lower turn-over, and fewer grievances began to occur. The rate of change came slowly at first, but as everyone openly talked together about the important issues, and trust began to build, the rate of change increased. There were about 1,300 people at the Belle Plant which handled many highly hazardous chemicals so learning to lead in a new way was a tough challenge.

In 1992 Knowles met Margaret Wheatley who had just written her book, *Leadership and the New Science*⁸ which looked at the implications of chaos and complex adaptive systems theories on how to lead organizations more effectively. When she visited the DuPont, Belle, WV Plant, where Knowles was the plant manager, she found that he was leading from a complexity perspective like she was espousing in her book. He had been intuitively developing this way of leading already for 3-4 years. In working with Margaret Wheatley, he realized that this way of leading was a fundamental paradigm shift away from the top-down management approach. Knowles also realized that the patterns and processes that Bennett described provided the language and models that were useful as he thought about and used the ideas and insights from the sciences of chaos and complexity. Wheatley's work on applying the sciences of chaos and complexity to leadership, combined with the Systematics of Bennett and Knowles' own intuition had a profound impact on the way he learned to lead.

Since this time others have begun to write about leading from the complexity paradigm. Ralph D. Stacey, Douglas Griffin and Patricia Shaw in 2000 wrote about complex responsive process in their book, *Complexity and Management*⁹, Susan Steinbrecher and Joel B. Bennett wrote about heart-centered leadership in their book, *Heart-Centered Leadership: Lead Well, Live*

Well,¹⁰ and Sydney Dekker wrote about safety from a complexity perspective in *Just Culture* (2016) and *Safety Differently* (2014).¹¹

Partner-Centered Leadership

Knowles continued to study, refine and apply the ideas from complexity, complex adaptive systems thinking and Systematics to his leadership of the Belle, WV Plant, because the performance results kept getting better and better. This work has led to his development of the theory, the complexity tools and the leadership processes of Partner-Centered Leadership©. The main characteristic of this approach is the intense focus on openly talking with the people, listening, learning together, building trust and acting on what is learned. It is a recursive, cyclical process of understanding and engagement called a Hermeneutic Cycle where everyone is learning from each other and contributing their unique knowledge and perspectives¹². A culture of trust is created where it is safe to openly talk with anyone about ideas, provide feedback and explore better ways to do things. A metaphorical container is created (a strange attractor) that simultaneously provides order and focus for the organization while freeing those close to the work make the decisions they need to make to do their jobs more safely and effectively. Organizations are seen as if they are living systems. They are complex, adapting, self-organizing networks of people.

- Dynamical Organizations Theory© formulated in 2017 addresses how organizations change.¹³ It is based on Per Bak's Self-Organizing Criticality Theory.¹⁴ The organization changes, one conversation at a time.
- The Process Enneagram © was developed from 1986 to 2002. It is a complexity tool for focused, disciplined conversations that shows the “who” and “what” the organization really is and “how” and “why” the processes of the organization actually work; it bridges the theory of complex adaptive systems and practical application.^{15,16} With this tool the whole, the parts and the interaction of the parts can be seen and understood.
- The BOWL, a metaphorical container, is developed during a Process Enneagram workshop with the people and holds the organization together providing order and focus as well as freedom for the people to make decisions about how to do their work more effectively and safely. In chaos language, it is the strange attractor for the organization.¹⁷
- The Sustainability Ratios, developed in 2002, are practical, leading indicators for evaluating potential changes so a more sustainable future can be created.¹⁸
- Practical definitions, developed in 2019, for “leadership” and “managership” provide definitions for the actual roles for the people who are leaders and managers.¹⁹

Partner-Centered Leadership appears to be a process that can be used to move from Erik Hollnagel's *Safety I to Safety II*²⁰. Rosa Antonia Carrillo's new book (2020), *The Relationship Factor in Safety Leadership; Achieving Success Through Employee Engagement*, is also a good step in this direction²¹.

All this work is aimed at providing leaders a clear, simple, practical way to lead that produces outstanding results. While other managers may have intuitively developed similar leadership skills, for almost 35 years Knowles has focused intently on developing a deep understanding of self-organizing leadership (Partner-Centered Leadership) and how to share this with others.

The Case Study

In this case study, occupational safety and health data as well as toxic emissions release data, an indicator of the PSM performance, are used to show how the Belle, WV Plant actually performed using Partner-Centered Leadership on the one hand and top-down management on the other hand.

Occupational safety addresses injury prevention relating to things like slips, trips, falls, burns, bumps, etc. and occupational health addresses injuries like repetitive motion injuries and long-term exposure to hazards; both are measured by the number of OSHA Recordable Injuries reported in the OSHA Log.

Process safety management (PSM) addresses the use and handling of hazardous chemicals, and the safe operation of the chemical processes and equipment. The goal in PSM is to keep hazardous materials “in the pipes”. A way to measure the PSM performance is by considering the volume of chemicals released to land, air and water by the processes, whether by explosions, accidental releases, waste streams and sloppy performance. Low levels of releases indicate a stronger PSM operating discipline, standards and procedures while high levels of releases indicate a weaker PSM operating discipline, standards and procedures.

Partner-Centered Leadership was used in the first 8 years of the 19-year case study and the top-down management approach and Partner-Centered Leadership were used in parallel during the second part of the study.

Summaries of the two approaches are shown here.

Partner-Centered Leadership involves;

- leaders taking a stand and having very clear messages about the vision, the mission, safety and environmental performance and the current business situation,
- everyone spending some time together in the operations, out of their offices,
- listening, talking together and learning from each other, every day, about the important issues,
- providing feedback to each other regardless of level,
- sharing information abundantly and respectfully with all the people,
- being authentic and consistent in building trust and interdependence,
- helping people to see how their work is important to the success of the whole,
- making decisions at the correct level, closing the gap between work-as-imagined and work-as-done.

This results in

- creating a culture that brings the people together, is safe for anyone to share information, ask questions of anyone at any level, is full of feedback, and enables the people to make appropriate decisions related to their work, with a high level of operational discipline. This is an exciting culture where people can become the best they can be.
- People are seen as people and not employees. People relate to each other while employees relate to the legal aspects of the organization and the “boss-employee” relationship prevails.

The top-down management involves;

- only sharing information with a few people on a need-to-know basis,
- managers tending to stay in their offices,
- directions and orders being passed down from upper levels to lower levels,
- employees being expected to do as they are told,
- there is little feedback.

This results in creating a

- culture with a we/them climate,
- where the gap between work-as-imagined and work-as-done is wide, and
- it is not safe for people to openly share information, ask questions and develop better ways to do their work. This is a culture where morale is often very low and people just try to get by.

Figure 1 shows the annual Total OSHA Recordable Injury Case Rate (TRC) for the Belle Plant from 1986 to 2006. The procedures used to classify injuries and decide the injury rates for each year were consistent throughout the study.

Figure 2 shows the annual Toxic Release Inventory (TRI) as reported to the US EPA under the Clean Air Act. The data are in millions of pounds of toxic materials released to the air, water and land from the Belle Plant operations from 1987 to 2006.²²

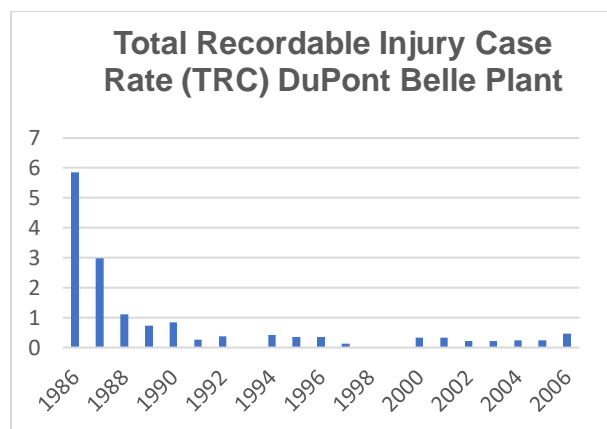


Figure 1

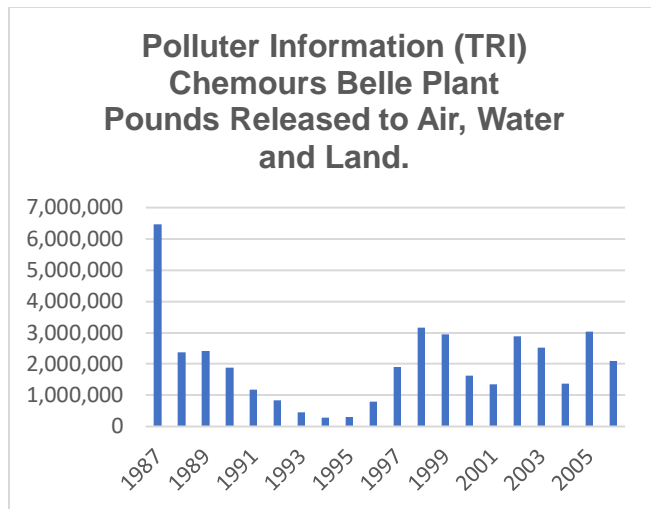


Figure 2

Comments

Knowles was The Belle Plant Manager from April 1987 to February 1995. At first, he used a harsh, top-down management approach from 1987 to 1989 to restore the standards. His stand was “I do not have a right to make my living at a place where it is okay for you to get hurt.” He helped to strengthen the operating discipline, and drove the safety processes with the result being both the TRC and TRI dropping quickly. But this process got stuck at a TRC of about 0.8, and an annual emissions level of about 2,000,000 pounds. The infighting among the managers struggling to lead this way was unsustainable.

So, Knowles shifted to the Partner-Centered Leadership approach and spent about 5 hours a day in the plant for 5 years talking with, listening to and learning together with the people. He talked a lot about the mission, vision and the standards that were needed. He emphasized the need for high operating discipline. He explained the competitive markets and the constant need to keep getting better. He asked for ways in which he could be more helpful to the people and for ways he could improve his own performance. He built the BOWL.

Most of the people wanted West Virginia to be cleaner and healthier. People began to work together and make decisions about things like the best way to fix a pump, unload a tank truck and brace a ladder thus sustaining the excellent TRC performance. They also were making decisions about PSM like shutting down a unit to fix a small leak or shutting down the entire plant when there was a huge rain and electrical storm in order to prevent an uncontrolled release if there was an electrical failure on the plant. The engineers worked hard with the supervisors, operators and mechanics on improving PSM. The entire workforce was quite proactive in their efforts to improve operating discipline and reduce releasing toxic materials into the environment.

As the people came together, making improvements in all aspect of the work, the TRC, as shown in Figure 1, dropped quickly to about 0.3 and remained there for 17 years. The TRI also dropped to about 278,000 pounds by 1995. Both the TRC and the TRI had dropped by over 95%.

It should also be noted that during the time that Knowles was using Partner-Centered Leadership and both the TRC and TRI had fallen by over 95%, productivity rose by 45% and the earnings rose by 300%. Partner-Centered Leadership positively impacted everything.

After Knowles left in 1995, five different, DuPont-trained, plant managers were sent to the Plant. They liked the TRC performance, so they rarely went into the plant and talked with the operators, mechanics and shift supervisors. These people continued to use what they'd learned with Partner-Centered Leadership to maintain this excellent level of TRC (Belle had the best TRC in the DuPont Company) until January 22 and 23, 2010 when everything fell apart (more on this later). These people, close to the actual work, sustained the TRC rate of about 0.3 from 1991 to 2010 for a total of 19 years.

But the volume of TRI emissions shown in Figure 2 rose from 275,000 pounds in 1995 to 2,000,000 in 1997, and about 3,000,000 pounds in 1998; a 10-fold increase. The TRI pattern did not follow the TRC pattern shown in Figure 1. The new plant managers used the traditional top-down management approach, and they lost the support of the people and the PSM fell apart.

Knowles made multiple visits to the Plant in the years after his transfer and had conversations with many people. He found that the new managers were using the traditional top-down management approach, did not value the sharing of information and building relationships of trust and interdependence with the people. They were under severe cost pressure just as Knowles had been. These new managers pulled many PSM decisions back to higher levels of management, thinking they would have more control, focused more on cost reduction, deferred maintenance, did not fund the needed preventative maintenance, delayed the completion of work-orders, allowed the frequency of inspections to drift to longer intervals, ignored nuisance alarms, and even failed to follow the DuPont standards. The operating discipline fell apart. In many cases the engineers were frustrated by the lack of top management support for their PSM efforts. These activities are at the heart of strong PSM programs.

The managers lost contact with the people by staying in their offices so the gap between work-as imagined and work-as-done widened. Morale fell, cynicism grew and trust was lost.

Then the events on January 22 and 23, 2010 showed that by not measuring key process safety leading indicators (CCPS; 2019) the business missed opportunities to protect people and the environment from loss of containment incidents. Even if they had the correct PSM systems in place, their poor operating discipline had disastrous effects (Klein and Vaughn, 2017)²³. Then, in just a 36-hour period, the Plant had a 25-pound oleum release to the air which makes a corrosive, white cloud, a 15,000-pound methyl chloride release to the Kanawha River, and a phosgene release that killed an operator who was doing his inspections nearby.

Just 8 months later in September of 2010 there was a release of 160,000 pounds of methyl alcohol to the Kanawha River. Then on December 3rd, 2010 two men were burned with

hot methyl amines at a poorly designed sampling port. The US Chemical Safety Board came in and conducted a thorough investigation.²⁴ In their report they mentioned that while the Belle Plant had the best TRC record in the entire DuPont Company before January 22, 2010, and the Board also pointed out a lot of the PSM shortcomings that were mentioned earlier.²⁵ The DuPont managers were not following their own PSM procedures. It was clear that PSM operating discipline had become a big mess as reflected by these incidents, and in the volumes of emissions shown in Figure 2 and the death of one of the operators.

Conclusions

Figures 1 and 2 clearly show how people behave and work differently when impacted by different leadership and management approaches. Partner-Centered Leadership created a safe space enabling the people to be the best they could be, allowing them to share information, talk about their problems together and make decisions about how best to do their work. They worked with a high level of operating discipline. Their TRC performance was terrific and sustainable. The gap between work-as-imagined and work-as-done was very small and the performance results were really good.

The top-down management approach used for PSM by the managers after 1995, was run in parallel to the Partner-Centered Leadership process. The top-down approach disempowered the people and prevented them from making the best PSM decisions. The gap between work-as-imagined and work-as-done grew wider, operating discipline weakened, emissions significantly increased and the performance fell apart.

These different results all happened with the same people, except the managers, the same plant, the same time period, the same business conditions and environment. The two different approaches resulted in two vastly different outcomes.

The Partner-Centered Leadership approach allowed the people to become the best they could be, to achieve terrific safety and environmental performance and to move the productivity and earnings performance to achieve better and better results. The top-down management approach disempowered the people and resulted in very poor performance.

This 19-year case study clearly shows, with hard data, that Partner-Centered Leadership, arising out of the new sciences of chaos, complexity and complex adaptive systems, and Bennett's Systematics is far superior to the top-down management approach arising out of Frederick Taylor's ancient work on scientific management in 1911.

Knowles has successfully used Partner-Centered Leadership concepts in hundreds of workshops in many countries with all sorts of organizations ranging from businesses to governmental organizations to health services organizations, to manufacturing and not-for-profit organizations with great success; this work never fails to help the organizations to improve, providing the people are willing to have purposeful conversations and learn together.

Partner-Centered Leadership is simple and easy to use. Just get up out of your offices, respectfully talk with the people, share information, listen to the feedback and comments, learn and grow together, identify the problems and opportunities and go get the work done.

Partner-Centered Leadership is a practical, proven way to bring many ideas related to Safety-II into actual practice in the workplace, and significantly improve all aspects of the business performance including safety. It is built on the fact that in most organizations, the people are doing most things right and want to keep getting better. It is not just about improving safety; it is about achieving excellence in all we do.

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