

Indiana Safety & Health Conference

Achieving & Sustaining High-Performance

Complex Adaptive Systems Work

Richard N. Knowles, Ph.D.
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Richard N. Knowles, Ph.D.

- **The DuPont Company (36 years)**
 - **Research (40 US Patents)**
 - **Manufacturing (Manager of several large chemical plants); I know how to lead safety and other culture changes.**
- **Expert in World-Wide Safety & Leadership Consulting**
 - **Australia, New Zealand, Malaysia, Canada, US, UK, Italy (20 Years)**
- **Expert in applying chaos and complexity theory to the study of how organizations actually work (27 years), publishing 23 papers and 3 books (2 Amazon Best Selling books).**
- **Creator of the Process Enneagram and pioneer for the Partner-Centered Leadership Process©**
- **Applying this New Paradigm to Business.**



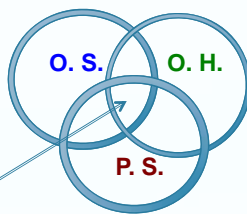
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Safety- Interacting Complex Systems

Occupational Safety

- Acute; Slips, Trips, Falls
- Deaths
- PPE, Training
- Ave. Cost of OSHA Recordable
- ~\$50,000/person
- Managed by people close to the work.
- Leading Indicator
- Safe Acts Index
- Near Misses

- Leadership Focus**
- **Systems**
 - **Processes**
 - **Communications**



Occupational Health

- Long-term
- Low levels of exposure
- Ergonomics
- Chronic exposures to many people
- Asbestos
- Lead
- Carpel tunnel
- High Costs/many people; >\$ millions
- Managed by people close to the work + health experts & researchers
- Leading indicator-weak signals (inside & outside) & changes in laws, NIOSH, USW

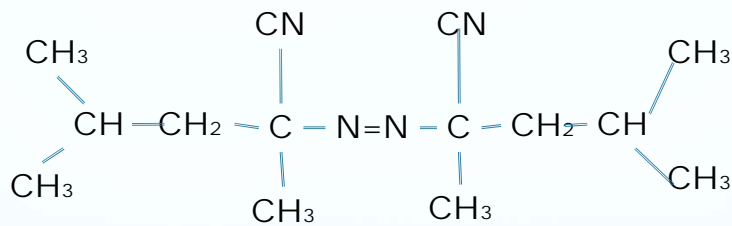
Process Safety

- Acute
- Spills
 - Releases
 - Explosions
- Chronic
- Ground water-C-8s
 - Air-Benzene
- Very high costs
- Many injuries
 - Deaths
 - Much destruction
 - \$ Millions to billions

- Managed by people close to the work + engineers, chemists, researchers, AIChE
- Leading indicators
- Near Misses
 - Adherence to standards
 - Timelines
 - Schedules
 - Backlogs
 - Inspections

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Vazo® 52



2,2'-Azobis (2,4-dimethylvaleronitrile)

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Observations During Our Fire and Its Aftermath.

- People...
 - **self-organize instantly-they know how to do this,**
 - **put down all their non-purposeful behavior,**
 - **managers do their thing and the operators and mechanics do their things,**
 - **work interdependently,**
 - **work hard with high intensity at high skill levels,**
 - **do more work faster and recover the operation quickly and**
 - **feel good about their accomplishments!**

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Characteristics Revealed in the Fire

- **The situation is compelling & obvious to all.**
- **The desired outcome is clear and unambiguous.**
- **Everyone has a stake in a successful outcome.**
- **People know they need to work interdependently and help each other-leaderfulness emerges.**
- **People know they have to work at their best in order to succeed.**
- **The best comes out in the people.**
- **We can't sustain the energy level required to put the fire out and to recover the operation over the long run.**

Instantly High Performance Teams

- **Cooperation**
- **Open Flow of Information**
- **Decisions at the front line**
- **Everyone pitched in**
- **Excitement**
- **Energy**
- **Good ideas & decisions; creativity**

Self-Organizing Criticality

- **Per Bak introduced this (SOC) in 1988.**
- **A fundamental property of nature.**
 - Sand piles (think of an hour glass)
 - Earth quakes
 - Forest fires
 - Traffic jams
- **The systems follow power laws.**
 - They self-organize, the energy builds and then the system suddenly shifts to a new order with many small changes, some larger ones and very few really big ones.

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Organizations Can Experience SOC

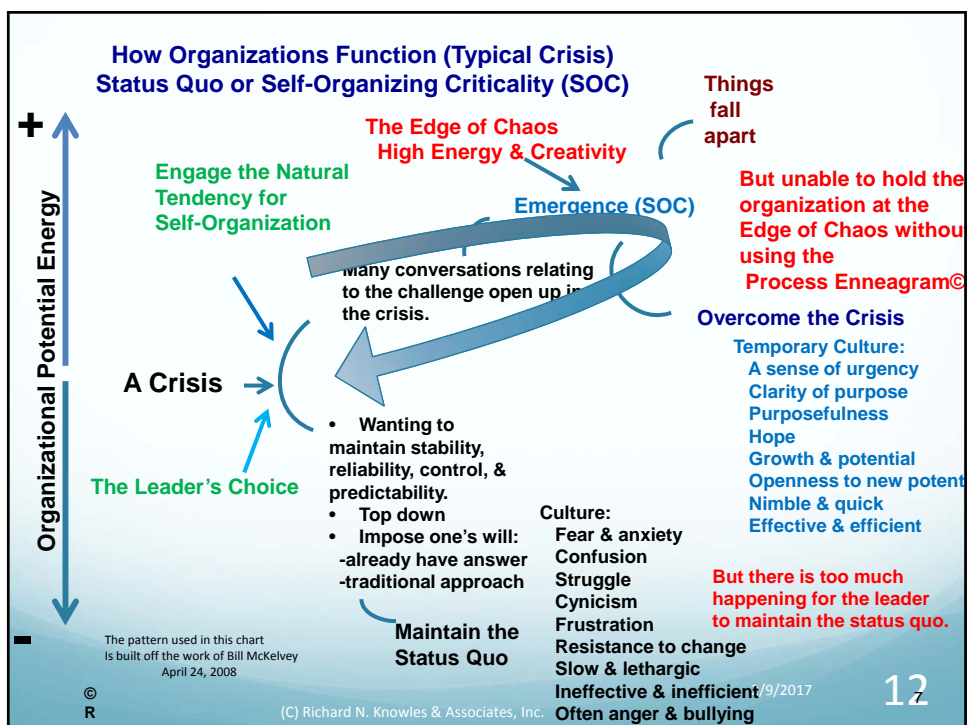
- The people in organizations self-organize by developing a shared identity, building relationships of trust and interdependence and abundantly sharing information. (Simple rules)
- Through myriads of focused conversations, energy builds, one conversation at a time; they move towards higher energy and SOC. (Adapting)
- The organization becomes leaderful.*
- The Process Enneagram is the tool that can be used to hold the organization at the edge of chaos where the energy and creativity are highest.

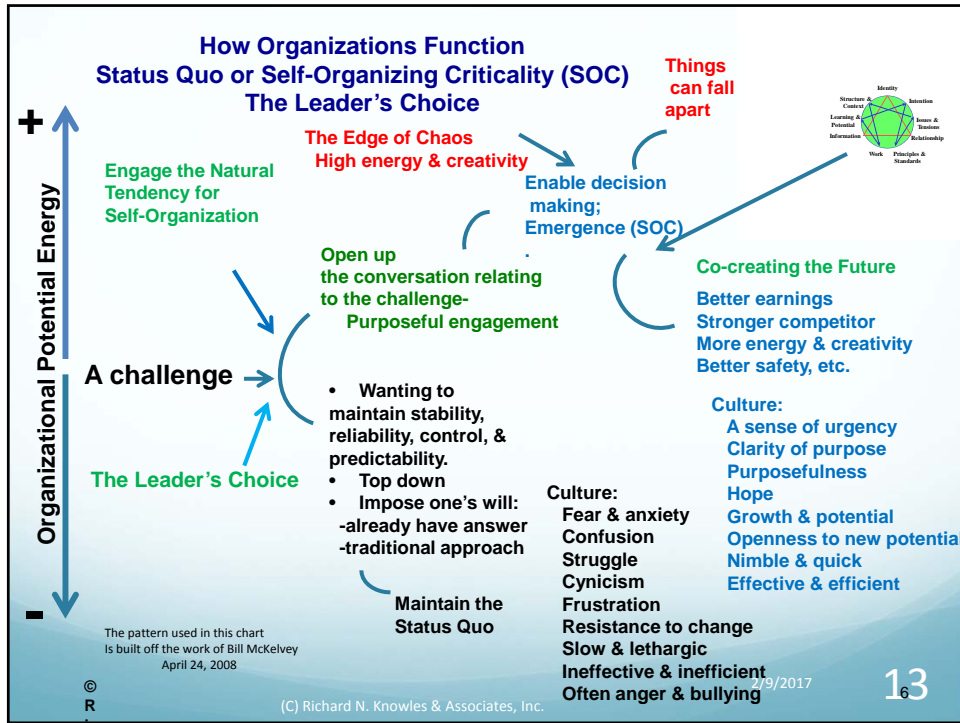
*"Leaderful" is a term created by Karen Ann Zien. It occurs when people see a need and they step forward to correct it getting the necessary help required.

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Open up the Conversations Destroy the Barriers...Show them you care!

The two best things you can do to improve your business are:

Go into the work place listening to and talking with the people;

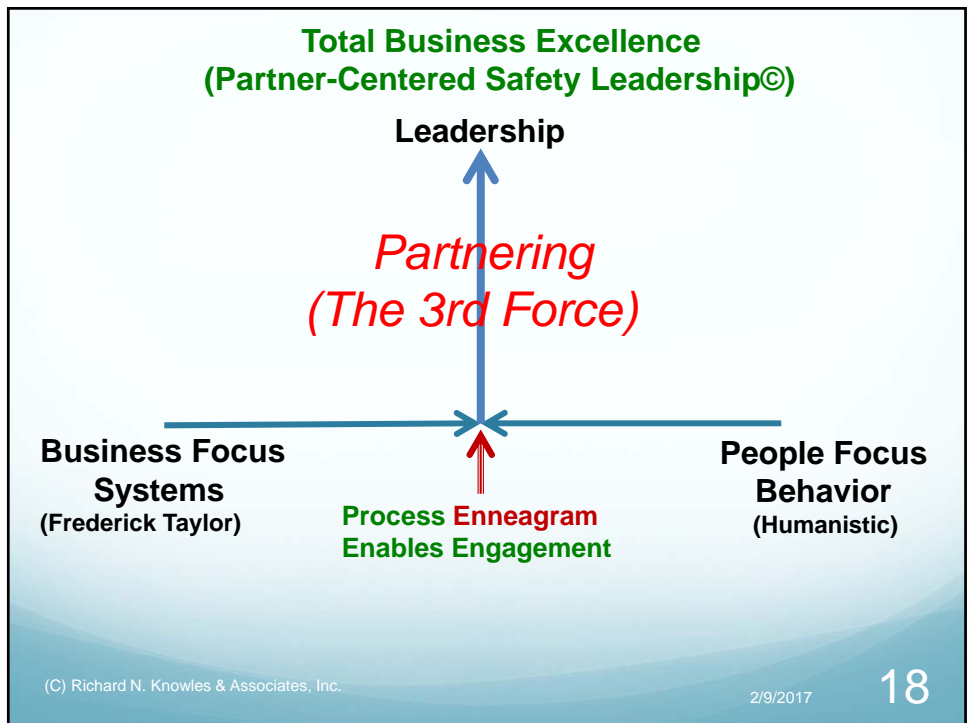
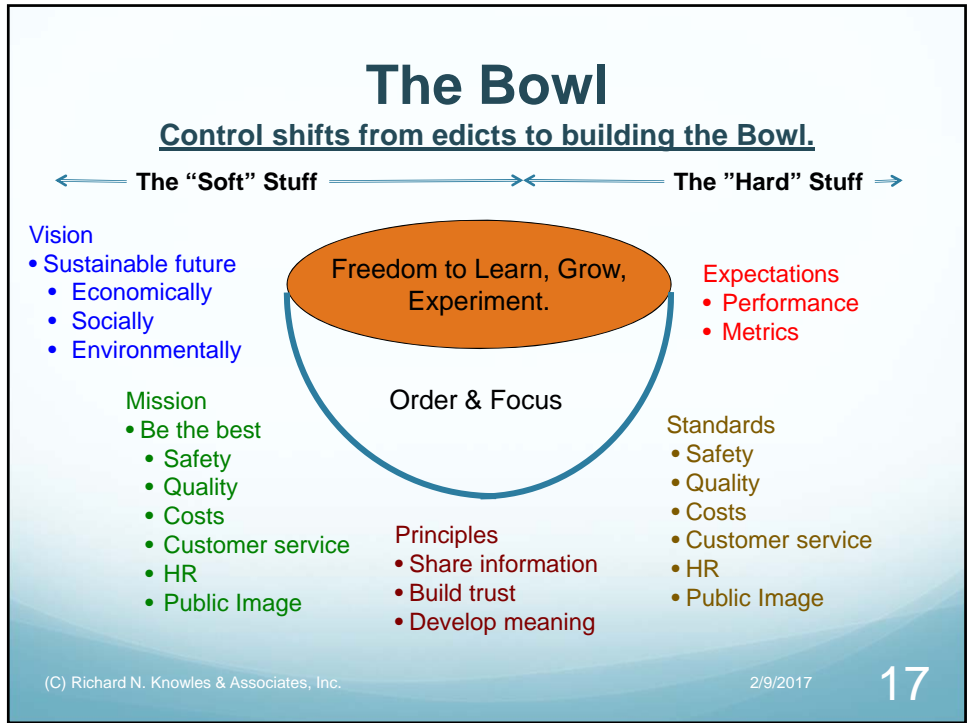
- about the importance of their families and going home in one piece
- about caring for and helping each other,
- about the importance of their contributions,
- about how the business is doing,

Create the space for them to make decisions about ways to improve how they do their work;

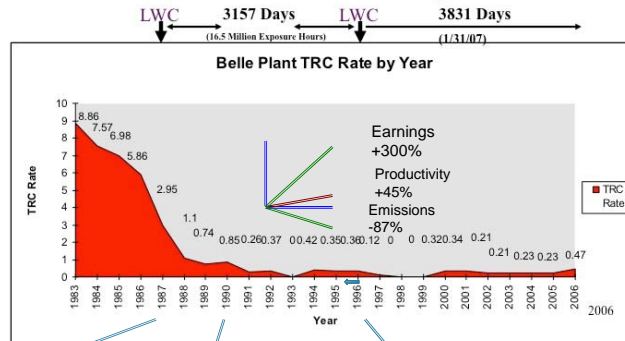
- encourage and listen to their ideas,
- help them to talk together and share their thinking,
- let them know that they can talk with anyone in the organization to
- find where they can get help and resources, you'll support them,
- Give them support & guidance.

Holding Things Together At the Edge of Chaos

- In using the Process Enneagram together and developing the Who, What, Why and How, a metaphorical container, an attractor, is co-created that is open to the flow of energy and information into and out of the organization.
- This container provides structure and order to hold the organization together along with the freedom for those closest to the work to make the best decisions and act on them.
- The Bowl (A Strange Attractor)



The Results are a Function of the Leadership Processes



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- Top-Down Change Processes**
 - Vision
 - Mission
 - Re-establish Standards
 - Discipline
 - Do Things Right

Processes similar to J. Kotters "Leading Change", Harvard Business Review, March-April 1995
- Partnering**
 - The Safety Leadership Process™
 - Move to Teams; Total Involvement
 - Chaos, Complexity, CAS
 - Process Enneagram™
 - BOWL-Order & Freedom
 - Self-Organization, Leaderfulness
 - Free Flow of Information
 - Building Trust & Interdependence
 - Walking the Plant 5 hours/day
- Five Different Plant Managers; Slowly Drifting Back to Top-Down Processes
- 2010 Disaster**
 - 2000 lb. Methyl Chloride Release
 - 22 lb. Oleum Spill
 - Phosgene Death

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Conclusions

- **Creative destruction of barriers & elimination of losses.**
- **New systems & processes are created!**
- **This releases enormous, positive, creative energy to solve problems and build a better future.**
- **This is teachable, applicable & sustainable.**
- **We in Richard N. Knowles & Associates are ready and willing to talk with you about these ideas so give us a call at 716-622-6467.**

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