

# Case Studies / Stories

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**FLUOR**<sup>®</sup>

SPC Trending Primer/ Two Day Training

[http://www.efcog.org/wg/esh\\_es/Statistical\\_Process\\_Control/index.htm](http://www.efcog.org/wg/esh_es/Statistical_Process_Control/index.htm)

# Case Studies

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- **Dr. Russ Ackoff's Double-Decker Bus**
- **Submarine Torpedo Facility**
- **K Basins Ergonomics**

# Story Time

- **Do not overlook the importance of story-telling**
- **Much of corporate culture is based upon story telling**
- **Charts are good, but if you can tie them to a good story, you have a powerful combination**
- **Consider the 30-second elevator speech**

# Russ Ackoff's Bus Story

- A friend approached Dr. Ackoff with the following problem
- A city in Europe had a bus system with double-decker busses



# The System

- **There are two employees on each bus – the driver and the conductor**
- **Each had been “incentivized” – driver’s pay was based upon miles driven, the conductor’s on observations of fare collection**
- **The conductor was to sell passengers tickets, and be sure as they exited they had paid for the proper number of “zones”**

# The Workers

- **The conductors were to signal the drivers if there were any passengers to get off at the next stop.**
- **If the conductors were busy, they couldn't signal and the drivers had to stop.**
- **On one bus, the conductor couldn't signal for three straight stops. The driver stopped the bus, and beat up the conductor.**
- **Violence routinely started breaking out between drivers and conductors.**

# Absolve the problem

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- At first the city tried to **absolve** itself of the problem. They hoped the problem would go away.
- It did not.

# Resolve the Problem

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- Next the city tried to **resolve** the problem. They asked the drivers and conductors to go back to straight pay, no incentive pay.
- The drivers and conductors went on strike.



# Solve the Problem

- Next the city tried to **solve** the problem. They hired university professors.
- They came up with the drivers and conductors should pool their incentive pay and split it.
- The drivers and conductors refused, they did not want to be dependent upon the other for their pay.

# “Solving” the Problem, part 2

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- **Dr. Ackoff’s friend tried to get the two parties together. He threw dinners and drinks for four conductors and four drivers at a fancy hotel for several nights.**
- **He ended up with a bill for damages to the room!**

# Dissolve the Problem

- **Dr. Ackoff asked the following questions:**
- **How many buses were in service at peak times? - 1,250**
- **How many stops? – 850**
- **Dr. Ackoff then suggested how to **dissolve** the problem through redesign.**

# Problem Dissolution

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- **What was his suggestion?**
- **Note, this story also introduces the ideas of absolve, resolve, solve, and dissolve as problem resolution techniques.**

# Submarine Torpedo Facility



- **The Submarine Torpedo Facility Charleston had a goal of processing 10 torpedoes per week set by SUBLANT**
- **We were routinely not making the goal**
- **I was asked to collect data about the torpedo maintenance process and suggest improvements**

# Examining the System

- **We collected start and stop times for a week for all work tasks**
- **Also looked at in process inventory**
- **Engine Cleaning turned out to be a key**
  - Only two junior personnel qualified
  - Dirtiest job of the process
  - Many torpedoes sitting waiting for engines
  - Many engines waiting to be cleaned

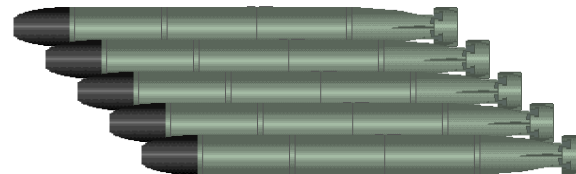
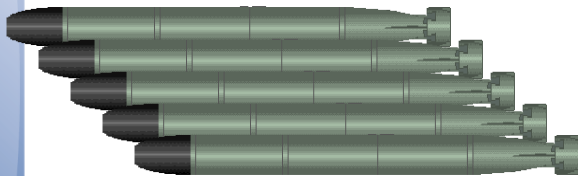
# Existing Focus

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- **There were four automated test equipment (ATE) lines**
- **Senior personnel made sure they stayed operational**
- **Usage log data showed one line was always idle**
- **Priorities and resources shifted from keeping all four ATE lines up to engine cleaning**

# Success

- **These two changes allowed the facility to easily process 10 torpedoes per week**
- **Started running out of torpedoes to process!**
- **Completed 10 torpedoes even during the week of a major inspection**

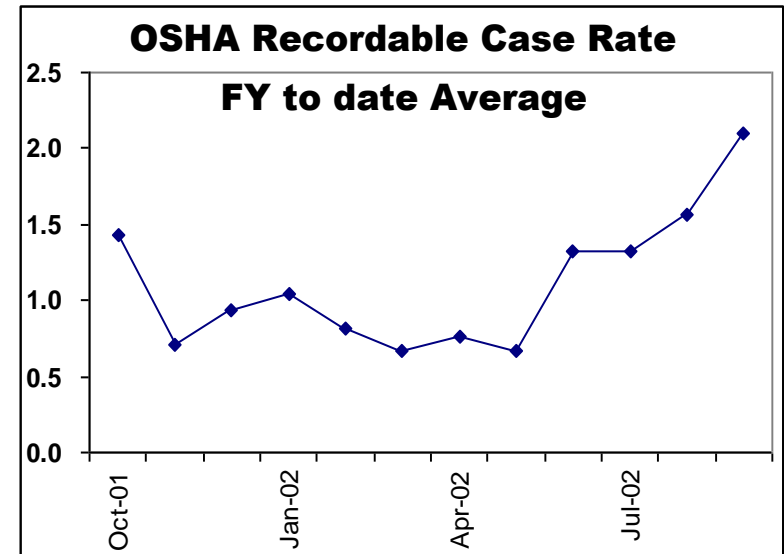
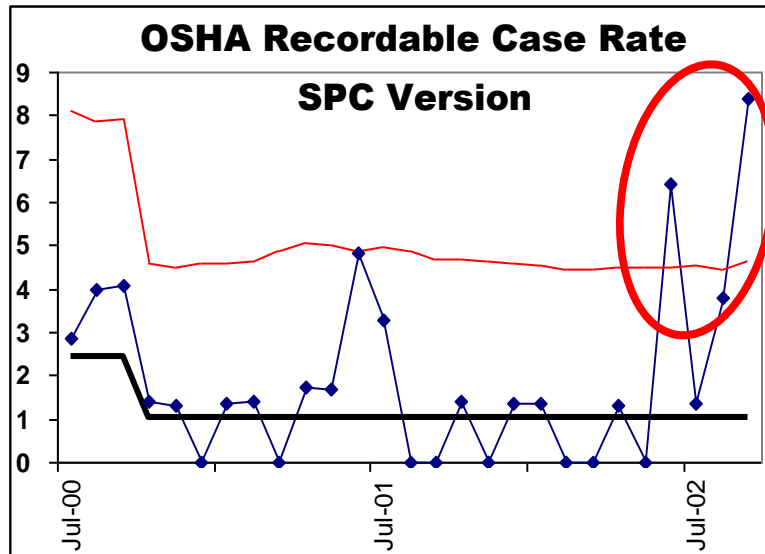




# Hanford K Basins

- **K Basins at Hanford was tasked with removing spent fuel from the basins**
- **Original process used automated processing equipment**
- **About 1/2 way through processing, the automated equipment failed, and workers had to shift to “long pole” manual processing**
- **Rotator cuff injuries sky-rocketed**

# Dueling Charts



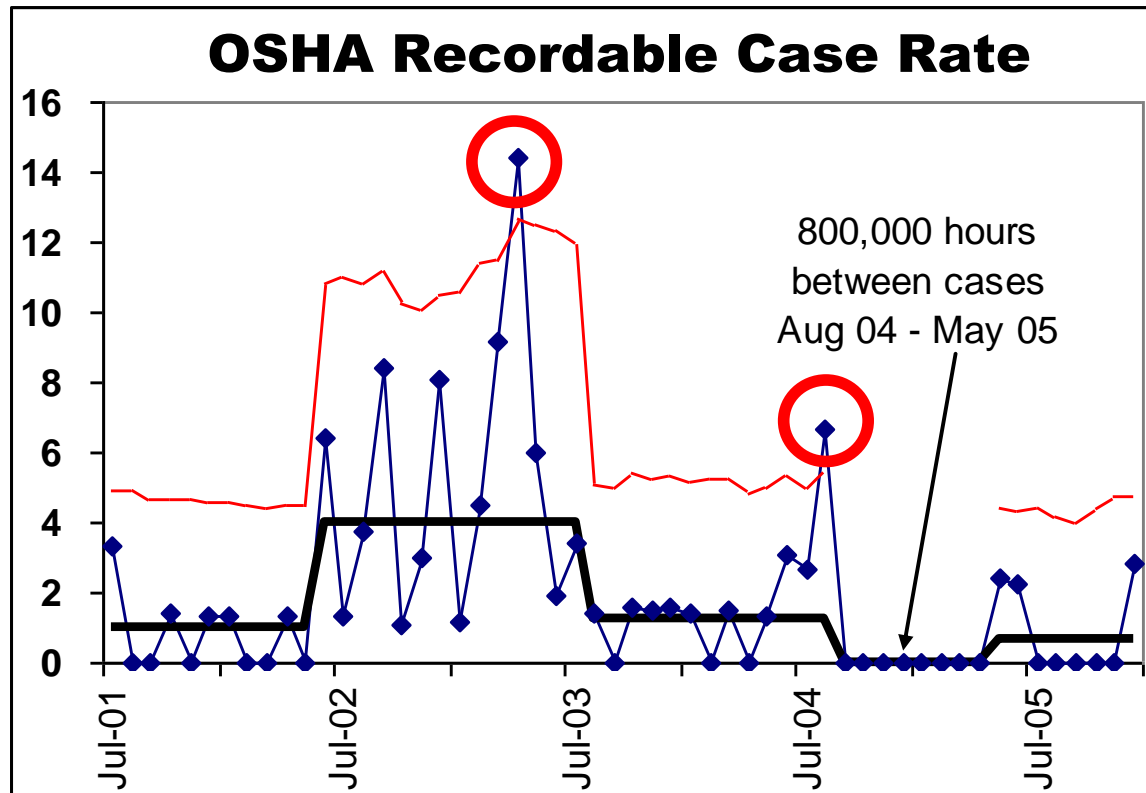
K Basins management was using a cumulative average, and did not acknowledge an increase until September 2002.

# Actions Are Taken

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- **Denise Brooks was brought in as an ergonomist**
- **She observed the work process, worked with the workers, and suggested inexpensive improvements**
- **The injury rates started dropping in June 2003, one year after the initial trend**

# Measurable Success



# Award-Winning Success

## Fluor receives workplace safety award

Jerry Schneider (center), Business Services, accepted a prestigious workplace safety award on behalf of Fluor Hanford from Association of Washington Business Chair Creigh Agnew (left) on Feb. 8. Rep. Larry Haler, 8th Dist-WA (right), also attended the awards ceremony that was held in conjunction with a legislative reception in Olympia. ■



## ***K Basins' ergonomic improvements win safety award***

***"Tooling and processes should fit the people, not the other way around."***

***Denise Brooks, ergonomics specialist***