#### To Infinity (and Zero) and Beyond Reflections on the Fabric of Lean and Six Sigma Quality

#### Presented by Dr. Bill Bellows

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October 26, 2005 Lean Six Sigma Summit West, Las Vegas, Nevada Abstract: Controversially, this session is about NOT doing Six Sigma and Lean. Bill will explain a more moderate approach, which he feels can be adapted more beneficially into individual companies. Using his experience at The Boeing Company, he will address the notion that every company needs a little fat - Lean is not always the right method to use. The purpose of this session is to provoke thought on whether or not your company should be adopting Lean Six Sigma or not, and hence more time has been allowed for inevitable questions and answers: Deciding your position: Just how moderate should you be? Dispelling the one-size-fits-all thinking Stop aiming for Zero: How leaders should make the decisions on implementation

## Aim

Introduce the *potential energy* of integrating the management theories and thinking of

Dr. Genichi Taguchi

Dr. W. Edwards Deming





Dr. Edward de Bono

and many others...

#### Decisions

"If your boss gives you a question and only 5 minutes to answer it, there are only 3 possible answers – 0, 1, and infinity. You'll have five minutes to decide which one it is." Professor R.E. Mayle

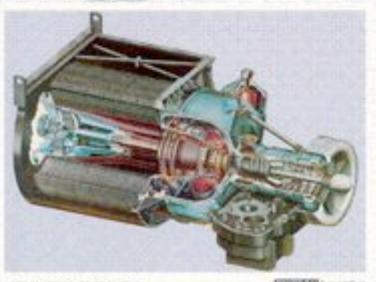
## **Perception & Thinking**

"How the world we perceive works depends on how we think.

The world we perceive is a world we bring forth through our thinking."

#### H. Thomas Johnson

## Tank Engines and Rocket Engines



AGT 1500 GAS TURBINE ENGINE

ETDESCI Lecoming





## **Courage To Imagine...**

"The courage to imagine the otherwise is our greatest resource, adding color and suspense to our life."

#### **Daniel Boorstin**

## InThinking & Enterprise Thinking

Increase individual awareness on thinking (InThinking)

Evolve the way we behave

Evolve the way we think together (Enterprise Thinking)

Evolve the way we run our organizations

# InSights



## W. E. Deming on Quality

"A product or a service possesses quality if it helps somebody and enjoys a good and sustainable market"

Source: The New Economics, W. Edwards Deming, 1993

### Variation....



## Variation....Exists



## **Philip Crosby on Quality**

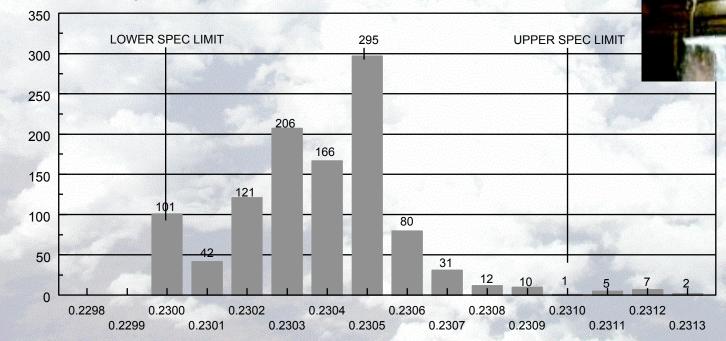
\*'Zero defects is another way of saying 'do it right the first time'"

Quality is defined as conformance to requirements

Source: Let's Talk Quality, Philip Crosby, 1989

### Defects

#### Frequency



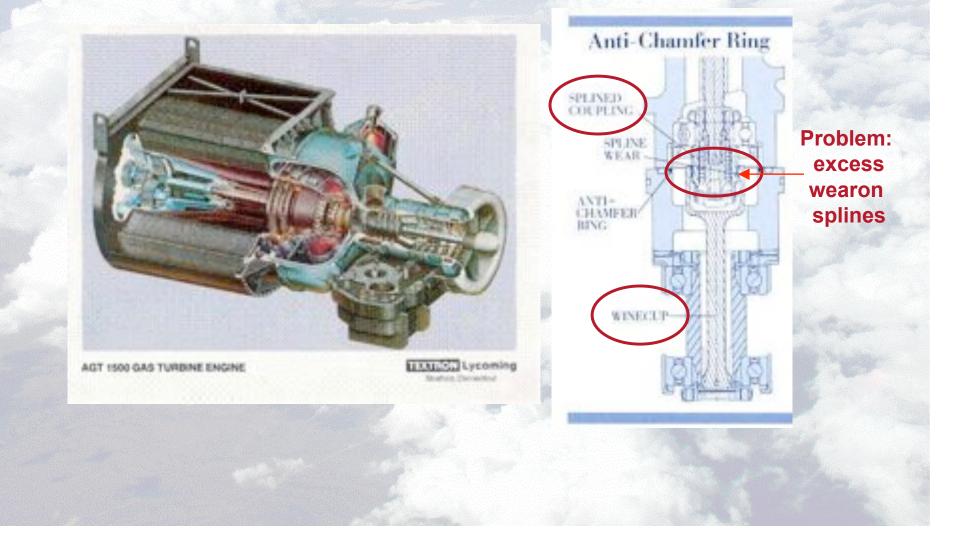
Hole Diameter, inches

## **Genichi Taguchi on Quality**

"Quality is the minimum of loss imparted to the Society by a product after its shipment to a customer"

Source: Introduction to Quality Engineering, Genichi Taguchi, 1983

## **Gear Wear Task Force**



#### **Edward de Bono on Quality**

"The quality of our thinking will determine the quality of our future."

Edward de Bono

## **Resource Management**



## The Boeing Company -Vision 2016

#### Core Competencies

- Detailed Customer Knowledge
- Large-Scale Systems Integration
- Lean Enterprise

#### Values

- ✤ Leadership
- Integrity
- Quality
- Customer Satisfaction
- People Working Together
- A Diverse and Involved Team
- Good Corporate Citizenship
- Enhancing Shareholder
   Value

## **Expectation Dynamics**

#### Value

Delight

Satisfaction

Expectation

Disappointment

#### Assumptions

- A better way to operate an organization is to invest resources with the ability to manage customer delight, satisfaction, and disappointment
- Better investment results from discovering opportunities to invest
- The discovery of opportunities for investment is limited by how thinking is conditioned

#### What is needed ?

Thinking that promotes *better* discovery

## **Counting Heads**



## Togetherness

What does it mean to "work together"?
What does it mean to "learn together"?
What does it mean to "think together"?



### Together

"In or into contact or association" "In or into harmony or coherence" Merriam-Webster Dictionary

## **Counting Straws**



## Team?



## **United We Stand**



## **United We Eat?**



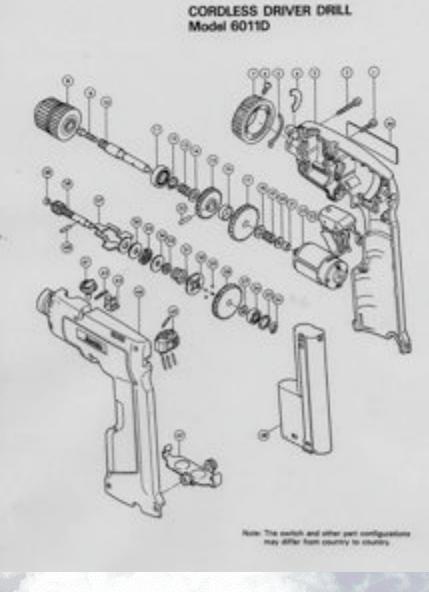
## **Special Reserve Blend**



Coffee farmers around the world were invited to send us their best beans for our annual coffee competition. Through precision and artistry, we blended and roasted the finest into something extraordinary.

Starbucks' Special Reserve Blend 2004

## Parts or Parts Of?



Industrial and Party

#### **Systems Perspective**

"When we try to pick out anything by itself, we find it hitched to everything else in the universe."

**Thomas Muir** 

## Water Logic





# **Cause & Effect**

MPG
Pulse
Exam Grade
Business Results

# What's Old?

Driving Change
Reliance on Reforming
Reducing Variation, Cost, Waste, Inventory, etc.
Talk about "Working Together"
Striving for "Zero Defects" and "Zero Waste"
Continuous Improvement
Using Metrics for Alignment\*

\*without a thinking transformation

Twin Day (AKA Variation Reduction Day)

# What's New?

Leading Transformation Use of Reformation and Transformation Resource & Relationship Management (Striving for Balance) Thinking & Learning Together - Then **Working Together** Continuous Investment Using Thinking for Alignment InThinking and Enterprise Thinking

# **Interchangeable Parts**

# **Interchangeable Parts ??**



#### **Space Shuttle Main Engine**

# **Interchangeable Parts ??**



# **Sorting Circles**

A

Connect the 2 of these 3 circles that are closest to being the same:

B

# **Sorting Circles, Part 2**

Which 2 of these 3 circles are closest to having the same diameter?



# **Cutting Wood**

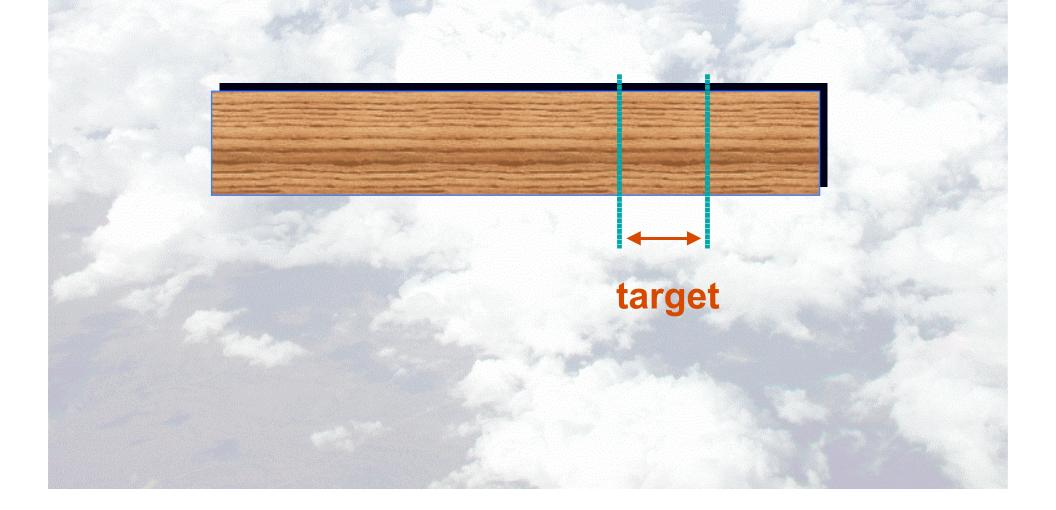
Given a piece of wood that will be cut into 2 pieces....



how many lines will be drawn across the top face before the cut is made ?

# **Cutting Wood** target

# **Cutting Wood**



# **Decisions Decisions**

Which 2 of these 3 circles are closest to having the same diameter?



# Taguchi's Quality Loss Function

#### "Loss to Society"

Lower Specification Limit TARGET (desired value of parameter) Upper Specification Limit

## **A Better View**

# "The Taguchi Loss Function is a better view of the world."

## W. Edwards Deming

Source: Out of the Crisis, W. Edwards Deming, 1986

# Better Thinking About Thinking

# InThinking & Enterprise Thinking

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# **Investment Opportunities**



# Technology

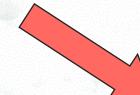
"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

#### **Albert Einstein**



# Transformation

## Potential Energy "Better Thinking"



### Kinetic Energy "Better Value"

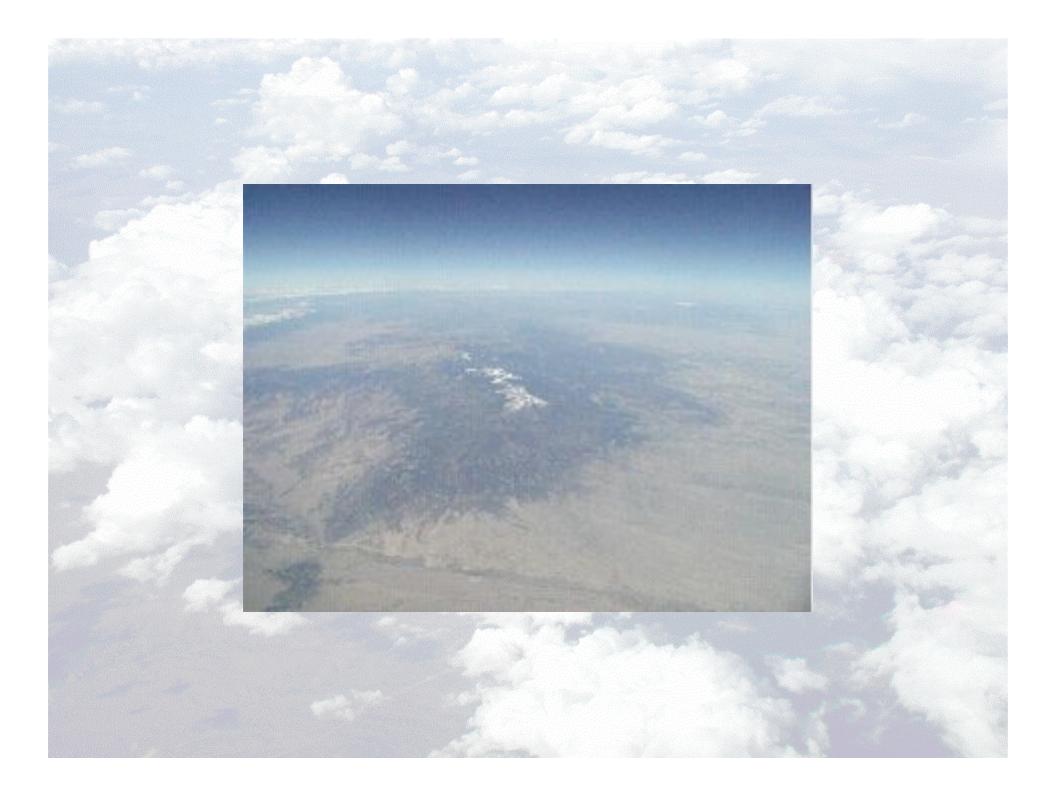
# Visioning

"it's not what the vision is that is important...

it's what the vision does..."

**Robert Fritz** 

Source: The Fifth Discipline, Peter Senge, 1992



# Imagine the Possibilities...

- when operating in an "Enterprise Thinking" environment
- If we could develop a broader appreciation of "continuous and connected learning"
- If we could develop a deeper appreciation of "working together," "learning together," and "thinking together"

Imagine the Possibilities... And the markets we could create Working Together **Investing Together Designing Together Building Together Learning Together Thinking Together** Leading Together

# What's Next?

Thinking Together
Rethinking "Working Together"
Rethinking "Learning Together"
Rethinking "Management"
Rethinking "Leadership"
Rethinking "Ethics"
Rethinking "Interchangeable Parts"
Rethinking ???

# What's Next?

"The greatest discovery of my generation is that human beings can alter their lives by altering their attitudes of mind."

## William James

