



## SPC

### LESSON: History of Quality Control - One Page Summary

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#### A. First quality era up to 1900: Operator Quality Control

- Americans credit Eli Whitney with inventing interchangeable parts.

#### B. ~1900-1920, which includes WW1: Foreman Quality Control, Industrial Revolution, Mass Production

- Henry Ford used assembly lines to make automobiles.
- Foremen were responsible for group operations and were NOT necessarily checking quality.
- World War I brought upon the need for full-time inspectors. They were at the end of the assembly line.

#### C. ~1920-1940: Inspector Quality Control

- With inspectors, productivity decreased as quality increased.
- Control charts were introduced in 1924 by Walter Shewhart.
- A control chart is a tool for distinguishing between special cause and common cause variation in a process.
- Continual process-adjustment in reaction to common cause variation increases variation in a process.
- Deming's funnel experiment shows why reacting to common cause variation doesn't improve quality.
- Dodge and Romig created Acceptance Sampling.

#### D. ~1940-1960: Statistical Quality Control

- During WWII, the U.S. used Statistical Quality Control (also called Statistical Process Control (SPC)), eliminating the need for inspection at the end of a process.
- MIL-SPEC documents were used to help achieve standardization objectives by the U.S. Department of Defense.
- American Society for Quality Control, now called American Society of Quality (ASQ), was founded.
- W. Edwards Deming, the Father of Quality Control, promoted SPC with American companies.
- U.S. ignored Deming, but Japan embraced his management methods, improving Japanese

quality within 2 years of WWII. <https://www.youtube.com/watch?v=GHvnIm9UEoQ> (start at 2:30)

- The Deming Prize is awarded to individuals and companies for accomplishments using his statistical applications.
- Joseph Juran is also credited with helping to rebuild Japan after WWII

## **E. ~1960: Total Quality Control**

- Other departments' personnel became part of the quality control process. Quality circles arose in Japan.
- The term “zero defects” (Philip Crosby) became prevalent – achieving productivity through worker involvement; this was for production of critical parts and assemblies, such as missiles and rockets.

## **F. ~1970-80s: Total Quality Control Organizational Phase**

- The Cause-and-Effect diagram, Ishikawa diagram, or fishbone diagram was created.
- Genichi Taguchi introduced how to Design of Experiment (DOE).
- After the 1970's when Japan was dominating U.S. markets, the U.S. decided it needed to focus on quality again.
- “If Japan Can ... Why Can't We?” was a 1980 NBC Special Report that focused on U.S. (lack of) quality.
- In 1980's, U.S. lagging behind other countries with respect to quality.

## **G. 1980's to present ...**

- Malcolm Baldrige Award, ISO 9000-9004, Six Sigma, American Customer Satisfaction Index (ACSI), ...
- We'll discuss the tools mentioned above in our upcoming lessons.