

Global Quality Management Advisors



Management Systems Focused on Quality Since 1991

The Next Quality Revolution

Our Nation. Your Organization.

Are We Ready?

White Paper

June 10, 2017

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Advisors | Consultants



Introduction

This paper serves as a journey through the origins, revolutions, and increased emphasis in the Quality and Safety Management disciplines beginning in 1900s. It includes some pivotal events, dates, and names a few individuals that also had an impact. To include all events and names would take months and our research would likely be incomplete. The following information, however, aligns with certain schools of thought that embrace the need to have a strong understanding of the past before one can plan and move into the future.

As Quality Advisors with GQM, we are challenged in this century to offer guidance to the next generation of executives and organizations that commit to develop, implement, and continual improvement for their “Management Systems Focused on Quality.” Executives that recognize the benefits of Quality and Safety focused management systems will experience a greater Return on Investment (ROI), disaster prevention, a pleased workforce, and satisfied shareholders. Today a few of the many tools include design assurance processes, advanced software modeling programs, enhanced manufacturing methodologies, verification processes, a well-trained workforce, well-defined customer expectations, accurate testing technology, and customer feedback.

A well-organized and well-executed management system must have inherent elements of honesty, integrity, and self-accountability. We are living in a period where innovative technology moves at an accelerated rate causing Quality and Safety to play an increasingly key role to ensure conformance with requirements. These are disciplines at the core of successful management systems. We have included known and some unknown events all of which generated the need for Safety and Quality applicable to products, services, and public services.

I worked on the Grand Coulee dam fresh out of high school. The Chief Engineer for the Golden Gate Bridge was also the Project Engineer for the dam (Harry Littlefield). Working on the dam was a fantastic eye opener. I began work as a laborer removing scaffolding forms by climbing a 100’ wooden ladder located on the face of the dam. Soon after I shifted tasks to helping electricians install the power generators which was all apprentice work.

I remember the depression days quite well during my grade school days which were quite memorable. Park City, Utah was a hard rock mining community comprised of many ethnically diverse groups: English, Irish, Spanish, Hungarians, Austrians, Swedes, and others.

My insights from the ‘50s ~’80s remind me of emerging global and national events that will clearly cause the elements of Quality and Safety to be center stage again during “The Next Quality Revolution.” The elements of “The Next Industrial Revolution” are already in process with so much more coming from the laboratories and the minds of the next generation. We all know our next generation of bright individuals will bring new fascinating products and services to the global market and benefit developing nations.

We feel this paper will provide a basis for understanding the general history of quality and safety for those just beginning the journey and perhaps a timely refresher for those well along the way. The pages that follow will help clarify as a nation “*How We Got Here & Where We’re Going.*” One of our many offerings for support includes our **Quality Insights** section on our website. If you have questions or comments after reading this paper, please use our website contact page or call us direct.

George J. Toly
Senior Advisor



As a “next generation” quality professional beginning in the early 1970s following Mr. Toly, I felt compelled to provide readers my initial work experience that describes “How I Got Here” (actually my start in the fascinating profession of Quality Management).

I entered the profession in 1973. I raised my hand one day while working for a small air control equipment supplier in Ohio that entered the fast-emerging nuclear power plant energy segment. Demonstrating proper safety-related functionality through compliance with specifications (quality), is a regulatory and industry mandatory requirement. Air control equipment plays a key role in nuclear plant safe operation and shutdown, plant worker safety, and environmental protection.

During the seventies, the U.S. experienced construction and eventual operation of its first fleet of commercial nuclear plants. Some offshore Owners procured the equipment as well. The following experience provided me a clear meaning of management commitment and unfortunately, in the following years, I experienced management in other companies not committed to quality and safety.

In 1974, we had equipment packaged in oversea qualified containers and shipped to the Port of Charleston, South Carolina for shipment to the Owner in Spain. A U.S. Inspection and Testing Company represented the Owner. An agreement was made to release the containers to SC with some approved test result documents from the inspection company ‘to follow’ in order to meet the oversea ship date.

Schedule, Cost, and Quality Impact: “Quality” was the cause of a company self-imposed “Stop Shipment.” This procedure is required in Nuclear Quality Systems / Programs. The Owner was notified and we monitored actions by the inspection company. There was pressure to resolve the “Quality” issue.

1. Schedule (pressure) – The contract ship date was threatened because the Export Import Bank of U.S. regulations only permitted 90-days for the exchange process before the need to restart.
2. Cost (pressure) – Our company could not invoice the Owner causing cash flow issues and quarterly performance concerns. Administrative time was impacted as well.
3. Quality – The Inspection / Test contractor still had not provided the mandated balance of test result documents required with the equipment for receipt inspection at the construction site. This is a standard industry practice for accountability and traceability reviews.

As the ship date from Charleston became critical, our company President entered my office one day to advise me that the Vice-Presidents were running out of patience. As a 25-year-old, I did get nervous and initially felt threatened for my job. This was the first and only time I initiated a stop shipment (it is test of management commitment). After explaining the issue and my actions to expedite results, he put his hand on my shoulder and said, “great job protecting us, please let me know when we can release shipment from Charleston. I’ll brief the VPs. Don’t be concerned.” That experience influenced a desire to grow in my newly found profession (helping run a business with integrity, honesty, and accountability).

Paul W. Gladieux
Founder | CEO

Quality

Basis

Quality The degree to which an item or process meets or exceeds the user's requirements and expectations. Most common industry definition: Conformance to Requirements.

Quality Policy The overall quality intentions and direction of an organization regarding quality as formally expressed by top management.

Quality Management System (QMS) The organizational structure, processes, procedures, and resources needed to implement quality management goals, objectives, and requirements.

Four Disciplines

Quality Leadership (QL) The Department of the Navy's definition of QL is based on W. Edwards Deming's ideas. "The application of quantitative methods and the knowledge of people to assess and improve a) materials and services supplied to the organization, b) all significant processes within the organization, and c) meeting the needs of the end-user, now and in the future."

Quality Management (QM) That aspect of the overall management function that determines and implements quality policy. Quality management includes strategic planning, allocation of resources, and systematic activities for quality such as quality planning, operations, oversight, and evaluation.

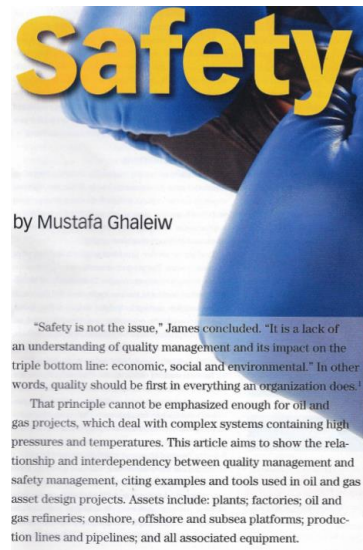
Quality Assurance (QA) Those planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfill requirements for quality.

Quality Control (QC) Those actions that provide a means of control and measure of the characteristics of an item, process, or facility to established requirements (inspection or source surveillance, or both).

We periodically recommend articles when they clearly articulate what we believe and want to share with those in business. It is encouraging when these unique, rare, and timeless articles emerge. We consider the article by Mr. Mustafa Ghaleiw, *Quality Progress* magazine, September 2013, timeless since it articulates the complimenting management disciplines of quality and safety. It is entitled "Quality vs. Safety – Priorities at Odds in the Oil & Gas Industry" is clearly a timeless article.¹

The three captions in the article by Mr. Ghaleiw on the following page provide the clarity for understanding the relationship and interdependency of quality and safety. He clearly states that is the aim of his article. Legible text for the captions is on the following page and the complete article is available via the American Society for Quality (ASQ) link:

http://www.itqm.ch/uploads/files/QM%20Excellence%20Article/ITQM_Quality%20vs.%20Safety%20in%20OilGas%20Industry.pdf



Legible Text for the Captions

- Quality is often viewed as secondary to safety in the oil and gas industries.
- Unless quality is elevated to a top priority, safety in these industries will be compromised, possibly leading to loss of life, pollution and damage to a company's reputation and revenue.

"**THE ABSENCE OF** a quality culture gave rise to six serious quality management failures," wrote Lowellyne James, a lecturer at the Aberdeen Business School in the United Kingdom, in his personal blog about the 2010 British Petroleum (BP) Deepwater Horizon oil spill. "Together," he wrote, "these failures caused a tragic loss of life and catastrophic environmental disaster."

The absence of a quality culture cost BP a \$91 billion drop in its market value between April and June 2010. It sparked 350 lawsuits from the general public, damaged its brand image, led environmental groups to attack all offshore drilling, caused shareholder dissatisfaction and knocked the organization from its position as an industry leader.

"Safety is not the issue," James concluded. "It is a lack of an understanding of quality management and its impact on the triple bottom line: economic, social and environmental." In other words, quality should be first in everything an organization does.¹ That principle cannot be emphasized enough for oil and gas projects, which deal with complex systems containing high pressures and temperatures. This article aims to show the relationship and interdependency between quality management and safety management, citing examples and tools used in oil and gas asset design projects. Assets include plants, factories, oil and gas refineries, onshore, offshore and subsea platforms, production lines and pipelines, and all associated equipment.

It is important to recognize Mr. Lowellyne James contribution to Mr. Ghaleiw's most important article (Ed.).

Reference 1, Lowellyne James, PhD, "BP's Deepwater Horizon: A Quality Issue or a Safety Issue?" Sustainability and CSR Insights (blog), Oct. 21, 2012, <http://ow.ly/nQVjf> (case sensitive).

www.lowellynejames.com

How We Got Here & Where We're Going

Pre - 1900 **SI** 1920s 1930s **QC** 1940s **QC IP Inspection** 1960s **QA** 1970s 1980s **QM** 1990s 2000s **ISM** 2017

- 1 **Pre ~ 1900 Self-Inspection Evolves to Separate Product Inspections / Tests**
- 2 **1930 ~ Quality Control with SPC**
- 3 **1940 ~ Quality Control – World War II (Mass Production) In-Process Inspection**
- 4 **1965 ~ Quality Assurance with Quality Control**
- 5 **1985 ~ Quality Management**
- 6th **2017 ~ “The Next Quality Revolution” during President Trump’s “Industrial Revolution” Possibilities on page 12 and 13 (TBD)**

Example significant events are listed that help raise the awareness of how quality and safety can affect the lives and businesses of everyone.

- **Red** – Disasters due to an absence of commitment to quality and safety.
- **Grey** – Recognized need for the highest quality and safety management standards.

Quality Affecting Significant Events (Examples)	
• 1912	RMS Titanic Atlantic Ocean (UK)
• 1941	World War II Mass Production (U.S.)
• 1955	Post-War Aerospace (U.S.)
• 1955	Naval Nuclear Program (U.S.)
• 1955	Atoms for Peace (Global Effort)
• 1960	Global Space Race (NASA, U.S.)
• 1968	Commercial Nuclear Power (U.S.)
• 1979	TMI Unit 2 (Pennsylvania, U.S.)
• 1984	NRC NUREG-1055 Report to Congress Nuclear Industry Quality / Safety / Management Failures (U.S.)
• 1986	Challenger Shuttle (U.S.)
• 1986	Chernobyl (Russia)
• 1988	Piper Alpha Oil Spill (North Sea)
• 1989	Exxon Valdez Oil Tanker Spill Prince William Sound (Alaska, U.S.)
• 2001	911 (New York City, U.S.)
• 2002	Prestige Oil Spill (Spain)
• 2002	Davis Besse' Reactor Head (Ohio, U.S.)
• 2003	Columbia Shuttle (U.S.)
• 2008	Metrolink Train (Southern CA, U.S.)
• 2008	B2 Bomber Crash (U.S.)
• 2010	Deepwater Horizon BP Oil Spill, Gulf of Mexico, 87 Days, (UK)
• 2011	Fukushima Daiichi (Japan)



Root cause analysis of those in red eventually revealed each could have been prevented. Typically, it's a matter of priority – Cost | Schedule | Quality. These are the original three elements of success established by the U.S. Military, the Project Management Institute, and other entities.

We do not have “Cost of Poor Quality” numbers for these events at this time. We do not have the numbers for people injured or disabled and those that lost their lives as a result of pressure from executives to meet a schedule for the sake of increased profits.

Safety and quality management, over the last fifty years, have emerged as key operational and program functions for a number of reasons. Professionals in operational support disciplines such as regulatory compliance, safety, quality performance, nuclear safeguards, expert witness, environmental, forensic science assessments, and Quality and the Law have a continual desire to perform root cause analysis to reveal the basis of disasters. Their primary focus and value to a business entity is, however, providing expertise to mitigate disasters. Considering President Trump has a strong long-term vision and position on a “The Next U.S. Industrial Revolution;” all private and public entities need to unconditionally commit to support professionals working in these valuable management disciplines.

Other Pivotal Events

Pre-1900 **Self-Inspection Evolves to Separate Product Inspections / Tests**

Craftsman self-inspection evolves to separate product inspections / tests until the early 19th century, manufacturing in the industrialized world tended to follow this craftsmanship model. ASME founded, FBI expanded service for public safety. Horseless carriages began to appear. Market crash.

- ❖ The factory system, with its emphasis on product inspection, started in Great Britain in the mid-1750s and grew into the Industrial Revolution in the early 1800. Nicola Tesla and Thomas Edison² masters of electrical current innovations.
- ❖ In the early 20th century, manufacturers began to include quality processes.
- ❖ Henry Ford³ creative industrialist, inventor, entrepreneur. Born on July 30, 1863, near Dearborn, Michigan. Henry Ford created the Ford Model T car in 1908 and went on to develop the assembly line mode of production which revolutionized the industry. However, more than for his profits, Ford became renowned for his revolutionary vision: the manufacture of an inexpensive automobile made by skilled workers who earn steady wages.
- ❖ **Boiler Explosion in Lynn, Massachusetts, 1905.** It motivated the Governor to include in his inaugural address a demand for prompt action for improved public safety. One outcome of this mandate was the creation of a new "Massachusetts Law" An Act Relating to the Operation and Inspection of Steam Boilers" (1909).
- ❖ This motivated another state, Ohio, to draft their own laws in 1911. At the same time, as both states were developing laws; ASME looked to the future in a way that would change the boiler industry through standardization. From ASME's actions, the first edition of the Boiler and Pressure Vessel Code (BPVC) was issued in 1914 and published in 1915.⁴
- ❖ **1912, RMS Titanic Atlantic Ocean (UK)**
- ❖ The 1920s was a period of syndicated crime, Al Capone, John Dillinger, the infamous birth of the "G-man," and the Tommy gun," daring bank robberies, speak easies, Liquor bootlegging, were rampant, Susan B. Anthony.
- ❖ Women's Rights' – After Washington on March 22, 1920 ratification languished for months. Finally, on August 18, 1920, Tennessee narrowly ratified the Nineteenth Amendment, making it the law throughout the United States. Thus, the 1920 election became the first United States Presidential Election in which women were permitted to vote in every State.⁵
- ❖ The U.S Government (under J. Edgar Hoover) expanded the Federal Bureau of Investigation to control the spread and eradication of crime syndicates.
- ❖ U.S. Stock Market crashes in 1929 creating financial chaos.
- ❖ Wars in Europe forced many Europeans to seek safer havens.

1930 ~ **Quality Control with SPC**

The Great Depression, Midwest Dust Bowl, Migration to the Western US., Franklin Delano Roosevelt Elected President, Formation of Civilian Construction Corps (CCC), Work Project Administration (WPA), Hitler expanded occupation in Europe, WWII between Germany and European countries begins. Era of Einstein, Employment in US economy staggers, Quality of products diminish.

- ❖ 1933, Albert Einstein left Germany and arrived in the U.S. The stock market crash in 1929, led to the defeat of Herbert Hoover as President in 1930. Unemployment was high and skilled disciplined laborers were idle. This was a time for Public Works construction projects.
- ❖ President Franklin D. Roosevelt instituted the WPA and CCC to reform and train the unemployed in skilled crafts.
- ❖ Self-inspection and pride of craftsmanship was the model of the time.
- ❖ One of the most famous American gangsters, Al Capone, also known as "Scarface," was sent to Alcatraz Prison in 1934 for a tax evasion conviction.
- ❖ July 22, 1934, John Dillinger was killed by FBI agent Melvin Purvis in Chicago.
- ❖ The "Public Enemy Crime Era" was coming to an end.
- ❖ The Golden Gate Bridge – Construction commenced on January 5, 1933 and completed on May 28, 1937 (just over four years).
- ❖ Grand Coulee Dam⁶ – Mason City, WA., 1933, Construction of the dam was included in the Depression Era Public Works Administration. The program provided jobs for the unemployed by developing the nation's resources. The Bureau of Reclamation was placed in charge of the project.

1940 ~ **Quality Control – World War II (Mass Production) In-Process Inspection**

High volume production material produced, Equipment for inspection / testing, Science and technology increased. Rocketry science, Great scientific minds emerge such as Einstein, Von Braun, Rickover, Oppenheimer, Tesla, and others.

- ❖ 1941, Japan bombed Pearl Harbor Dec. 7, 1941 (U.S. beginning of Mass Production).
- ❖ 1943, Physics – Albert Einstein becomes U.S. Citizen.
- ❖ New energy (atomic bomb) was unleashed. It was developed and in AL Magodo, NM and used on Hiroshima and Nagasaki Japan.
- ❖ VE day April 1945. President Roosevelt died in April 1945, VP, Harry S. Truman took the Presidential oath. The atom bomb was use and Japan capitulates.
- ❖ After the United States entered World War II, quality became a critical function during the war effort.
- ❖ Bullets manufactured in one state, for example, had to work consistently in rifles made in another. The armed forces initially inspected virtually every unit of product; then to simplify and increase production, processes were introduced without compromising safety.

- ❖ The military began to use sampling techniques for inspection, aided by the publication of military-specification standards, and training courses using Walter Shewhart's statistical process control techniques.
- ❖ This was the beginning of the "Atomic Age" - nuclear fission unleashed new energy era.
- ❖ More controls, more regulations emerge, exotic materials, innovative manufacturing practices, communications, transportation, etc., increased the demand for Safety and Quality Management.
- ❖ Formation of the PTC 22 Gas by the Turbine Power Plants Committee.

1946 ~

Quality Control Evolving to Quality Assurance

Oil and gas exploration increase, Uranium mining increases, United Nations established forcing countries to begin reconstruction. WWII is over, Vets returned, Skilled labor jobs increased, GI bill introduced for housing and education, Nuclear Bomb tests in Nevada, & New Caledonia. The U.S. Naval Propulsion Program began. The birth of Total Quality in the United States came as a direct response to the quality revolution in Japan following World War II. Advanced jet aircraft, Jonas Salk, Polio no longer an incurable disease, and others.

- ❖ The Japanese welcomed the input of Americans Dr. Joseph M. Juran and Dr. W. Edwards Deming. They were and still are recognized for their efforts to train the Japanese sampling inspection & improved organizational processes resulting in very high-quality products.
- ❖ Tesla, the father of the Alternating Current died in New York City.
- ❖ 1946, Muchly and Presper left the University of Pennsylvania and received funding from the Census Bureau to build the UNIVAC. This was the first commercial computer for business and government applications.
- ❖ 1947, Roswell New Mexico flying saucer incident and Nevada's Area 51 in the news.
- ❖ The **Korean War** is often called "**The Forgotten War.**" It began when communist North Korea invaded South Korea in 1950. When the war ended in 1953, Korea was still divided and it remains that way today.
- ❖ Former General Dwight D. Eisenhower elected President of the United States.
- ❖ Arco, Idaho was the first community in the world ever to be lit by electricity generated solely by nuclear power. This occurred for about an hour on July 17, 1955, powered by Argonne National Laboratory's BORAX-III reactor.
- ❖ U.S. major Interstate Highway Construction begins.
- ❖ New government agencies are created for the purpose of providing manufacturing safety and quality guidelines.
- ❖ On March 26, 1953, American medical researcher Dr. Jonas Salk announced on national radio that he successfully tested a vaccine against poliomyelitis, the virus that causes the crippling disease of Polio. In 1952, an epidemic year for Polio, there were 58,000 new cases reported in the U.S. More than 3,000 died from the disease. Eventually the vaccine eradicated the disease.
- ❖ 1957, Russians launch Sputnik, man enters space, the race to conquer space begins.
- ❖ 1958, U.S. began its entry to be the space travel leader, by establishing NASA.

1965 ~ **Quality Assurance with Quality Control**

Naval Nuclear Propulsion, Shipbuilding, Oil, Gas, Nuclear Power, Aerospace (NASA), U.S. astronauts on the moon, UFO sightings, Roswell incident, Computer age, Microsoft, Hewlett Packard, IBM Internet Communication. Military Standards, DOE, NRC, DoD, IAEA, compliance requirements, and others.

- ❖ Networking was a series of memos written by J.C.R. Lickliter of MIT in August 1962 discussing his "Galactic Network" concept. He envisioned a globally interconnected set of computers through which everyone could quickly access data and programs from any site. In spirit, the concept was very much like the Internet of today. Lickliter was the first head of the computer research program at DARPA, starting in October 1962.
- ❖ By the 1970s, U.S. industrial sectors such as automobiles and electronics had been broadsided by Japan's high-quality competition.
- ❖ TAPS Alaska Oil boom.
- ❖ The U.S. response, emphasizing not only statistics but approaches that embraced the entire organization, became known as total quality management (TQM).
- ❖ United States lands a manned space craft on the Moon. More venture followed.
- ❖ ICBM missile development continued with sophisticated rocketry. Rocket-dyne launch failure attributed to poor high-pressure gasket design.
- ❖ **1979, TMI Unit 2 (Pennsylvania, U.S.)**
- ❖ **1984, NRC NUREG-1055 Report to Congress, Nuclear Industry Quality / Safety / Management Failures (U.S.)**

1985 ~ **Quality Management**

Gurus Concepts: Dr. Shewhart, Dr. Deming, Dr. Juran, Dr. Feigenbaum, Phil Crosby. Standards: Evolution -ISO 9001 Standards, U.S. Malcom Baldrige Performance Program, Emerging Semi-conductor & Nano-Tech Sector & others.

- ❖ **1986, Challenger Shuttle (U.S.)**
- ❖ **1986, Chernobyl (Russia)**
- ❖ 1987, ISO 9001 & ISO14001 Quality & Environmental Management System Stds. & Certifications.
- ❖ 1987, U.S. Malcom Baldrige Performance Program (U.S. Department of Commerce).
- ❖ **1988, Piper Alpha Oil Spill (North Sea)**
- ❖ **1989, Exxon Valdez Oil Tanker Spill Prince William Sound (Alaska, U.S.)**
- ❖ Consultants & numerous books on quality.
- ❖ Advanced understanding & implementation of document / records management systems.

1995 ~

Global Shift - Economies & Competition Accelerates

We have explored the universe, Unmanned spacecraft reaches Mars, Black Holes discovered in the Galaxy, Weather changes, Climate changes, Natures rampages with Fires, floods, Hurricanes. Tsunamis, Nuclear reactor failures, Advanced Tools / Software Process Robotics – Enterprise-wide Software Platforms, DoE, Diagrams, Business Process Models, Metrics, -- Obama Care, Terrorist attacks – others.

- ❖ Major corporations began moving offshore to engage in a better business climate.
- ❖ Lack of unskilled workers decline and more foreign imports increase.
- ❖ Major Alaska Pipeline project deferred and there is evidence of pipeline leaks.
- ❖ Catastrophic gas pipeline explosion investigated, poor welding. Gas company increases Quality measures to correct situation from recurring.
- ❖ 2001, 911 (New York City, U.S.)
- ❖ 2002, Prestige Oil Spill (Spain)
- ❖ 2002, Davis Besse' Reactor Head (Ohio, U.S.)
- ❖ 2003, Columbia Shuttle (U.S.)
- ❖ 2008, Metrolink Train (Southern CA, U.S.)
- ❖ 2008, B2 Bomber Crash (U.S.)
- ❖ 2010, Deepwater Horizon BP Oil Spill, Gulf of Mexico, 87 Days (UK)
- ❖ 2011, Fukushima Daiichi (Japan)
- ❖ Advanced enterprise software platforms and 3D modeling.
- ❖ Toshiba of Japan U.S. Nuclear projects experience major construction delays.
- ❖ Toshiba declares bankruptcy of their Westinghouse branch.

2017 ~

“The Next Quality Revolution” during President Trump’s “Industrial Revolution”

Possibilities (TBD)

- ❖ **U.S. President Trump’s Administration** – Key executives from business, military, academia, public and private institutions most of whom understand the essential elements of correlation between cost & compliance.
- ❖ **U.S. Government under Trump Administration** – New cabinet recognizes the need for “Management of Quality” throughout all government entities. Creates new position: Secretary of Quality Leadership and Management Accountability [U.S. Offices of Commerce | General Accounting (GAO) | Entity Performance Excellence].



NOTE: Advisors with GQM have known for decades a key position for representing Quality Management is still missing in most boardrooms. “The Next Industrial Revolution” will succeed when CEOs create and fully endorse the “Chief Quality Officer” (CQO) position.

The CQO counterpart in the boardroom needs to be the CFO. Both have their focus on measuring, reporting, and improving operations. CFOs must focus on “Conformance to Financial Requirements.” CQOs must focus on “Conformance to Operating Requirements.” This relationship completes the scope of ensuring conformance, reporting effectiveness, and the basis for operational improvement.

- ❖ **Requirements & Configuration Management** – Refined Management Tools, Operations-wide Requirements Accountability, Executive Engagement in Cost of Poor Quality & others.

The General Quality | Safety Timeline shown on page 14 will help put the quality movement into perspective. We believe President Trump’s Agenda that includes “The Next Industrial Revolution” requires “The Next Quality Revolution” as a key integrated effort for successful results.

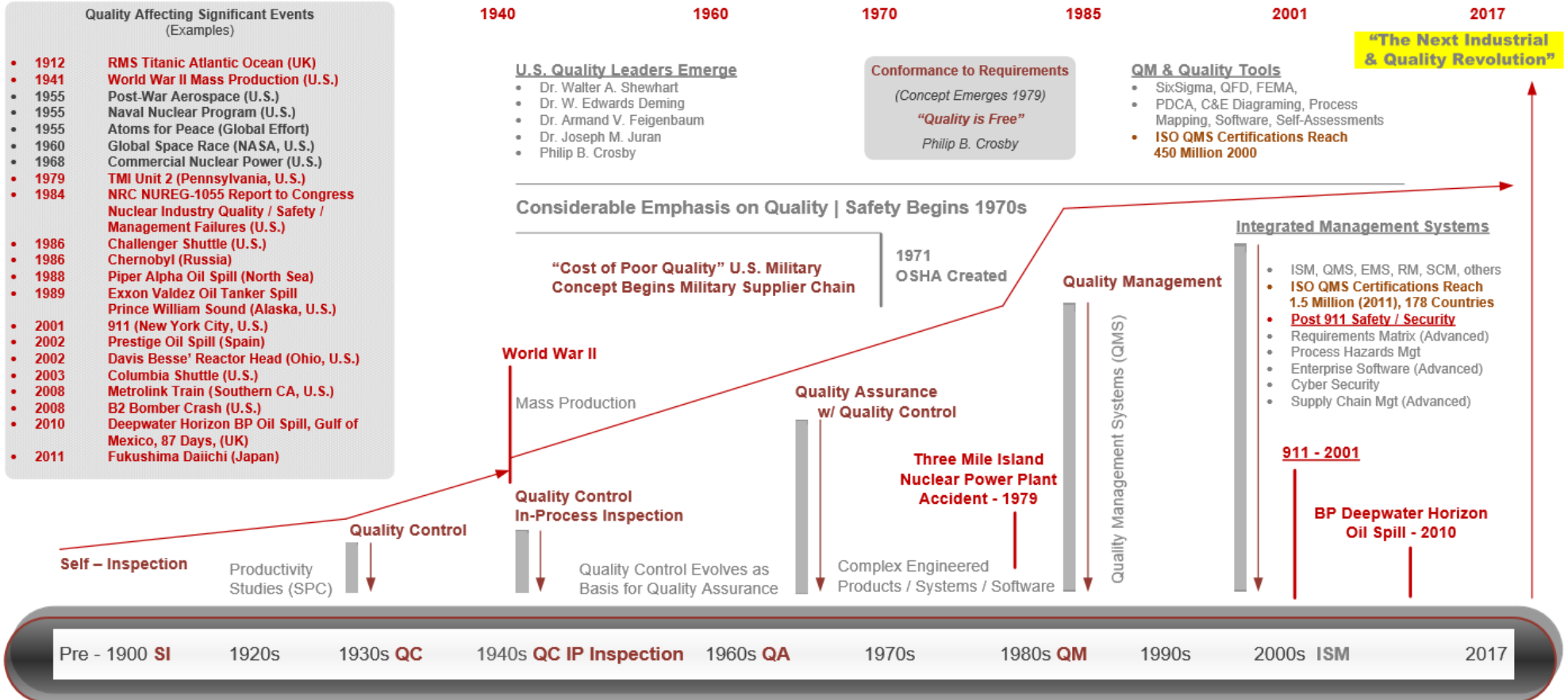
A nation that unconditionally embraces quality and safety as integral management disciplines throughout all business entities will change the world for the benefit of mankind. Most importantly, this will benefit generations to come and those needing an opportunity to live a safe, secure, and healthy “*Quality of Life.*”

There are three known large steps in Quality as listed here and depicted in the timeline.

- Pre – 1900, The Self-Inspection Method to Peer Inspection (Quality Control)
- 1940, The Control of Quality
- 1980, The Management of Quality
- 2017, The U.S. is positioning for The Next Industrial Revolution. Will it demonstrate its ability to make the fourth large step in Quality? Will our business entities recognize, prepare, resource, and act to ensure effective quality and safety management in time to succeed in “The Next Industrial Revolution?”

Our Nation. Your Organization.

Are We Ready?



1884 U.S. BLS Collects Data

1907 Report, 60 Workers Died in Pittsburgh Factories

1911, U.S. ASME BPVCS Boiler / Pressure Safety

1913 U.S. DOL Created

IAEA & ISO Formed

U.S. Commercial Nuclear Power

• Industry Standards – 1962 U.S. Mil-Q-9858A, UK BS-5750

• Nuclear Power Industry – 1965 Regulations / Standards

• Nuclear Power Public Law – 1969 10CFR50 Appendix B

• Nuclear Industry Standards –1971 ANSI N45.2 – 1971 Nuclear QA ANSI N45.2 – 1977 Nuclear QA ASME/NQA – 1979 Nuclear QA

QMS Movement

- 1987 ISO 9001 QMS Certifications International Sectors
- 1987 U.S. Baldrige Quality Performance Program (Department of Commerce)
- 1990 Quality Management Consultants

U.S. Report to U.S. Congress NUREG - 1055 Nuclear Safety / Quality Management Failures





Our future is in the hands of those who recognize the benefits of understanding and deploying “The Tools of Quality and Safety Management?” We believe knowing the general history will help executives and all employees plan and implement the proper tools in order to compete as the inevitable Next Industrial Revolution emerges. We encourage you to spend a little time reviewing each website for further awareness of quality management tools regarding business performance excellence, and quality management systems.

- The U.S. Department of Commerce is the administrative entity for the Malcolm Baldrige Business Performance Excellence Program (first release 1987). Administration by the National Institute of Standards and Technology.

Baldrige Performance Excellence Program (2017 – 2018)

<https://www.nist.gov/baldrige/publications/baldrige-excellence-framework/businessnonprofit?gclid=CNmRrPKcrdQCFYpMDQodYo8P-w>

Baldrige Foundation

<http://baldrigefoundation.org/what-we-do/foundation-awards/key-dates-for-awards-cycle/>

- The International Organization for Standardization (ISO) is the administrative entity for the ISO 9001 Quality Management Systems (QMS) Standards (first release 1987). The current revision is 2015.
<https://www.iso.org/iso-9001-quality-management.html>

NOTE: Over 1.5 million companies world-wide by 2011 were ISO 9001 certified.

Made in USA



Also see <https://gqmadvisors.com/insights/made-in-usa/> "Made in the USA" Author: George J. Toly.

This paper is posted on GQM Advisors website www.gqmadvisors.com (Insights > Articles).

References

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4. <https://www.asme.org/engineering-topics/articles/boilers/the-history-of-asmes-boiler-and-pressure>
5. https://en.wikipedia.org/wiki/Women%27s_suffrage_in_the_United_States#United_States_v._Susan_B._Anthony
6. <http://www.pbs.org/wnet/blueprintamerica/reports/profiles-from-the-recession/report-bridge-to-somewhere-public-works-administration/?p=693>