15 Minutes ~ The 'Nuclear CQO'

Nuclear
Be ~ 1st
'CQO in C-Suite'

Content From GQM Nuclear Advisors
'Nuclear Management Systems' Course

GQM nuclear advisors

Nuclear

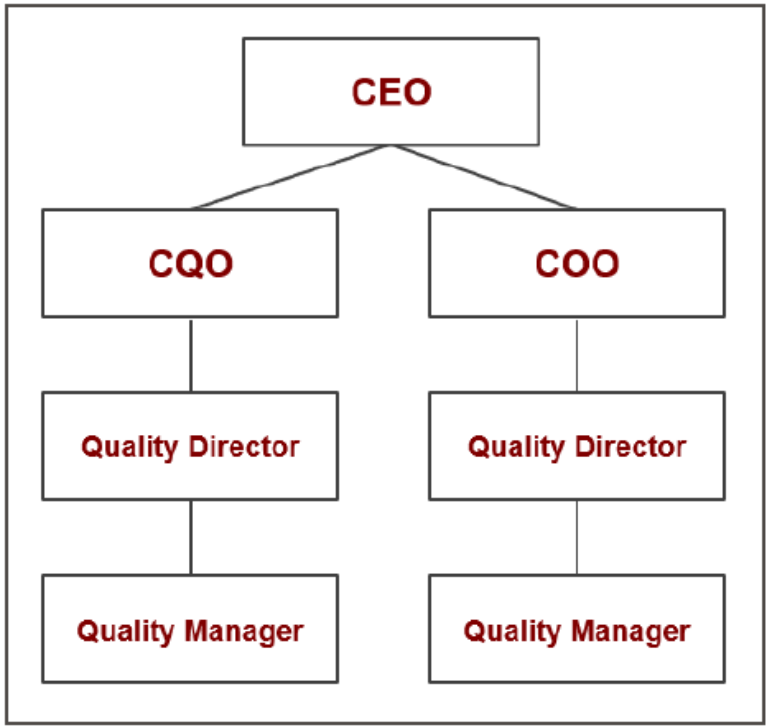
Safety-Related

=

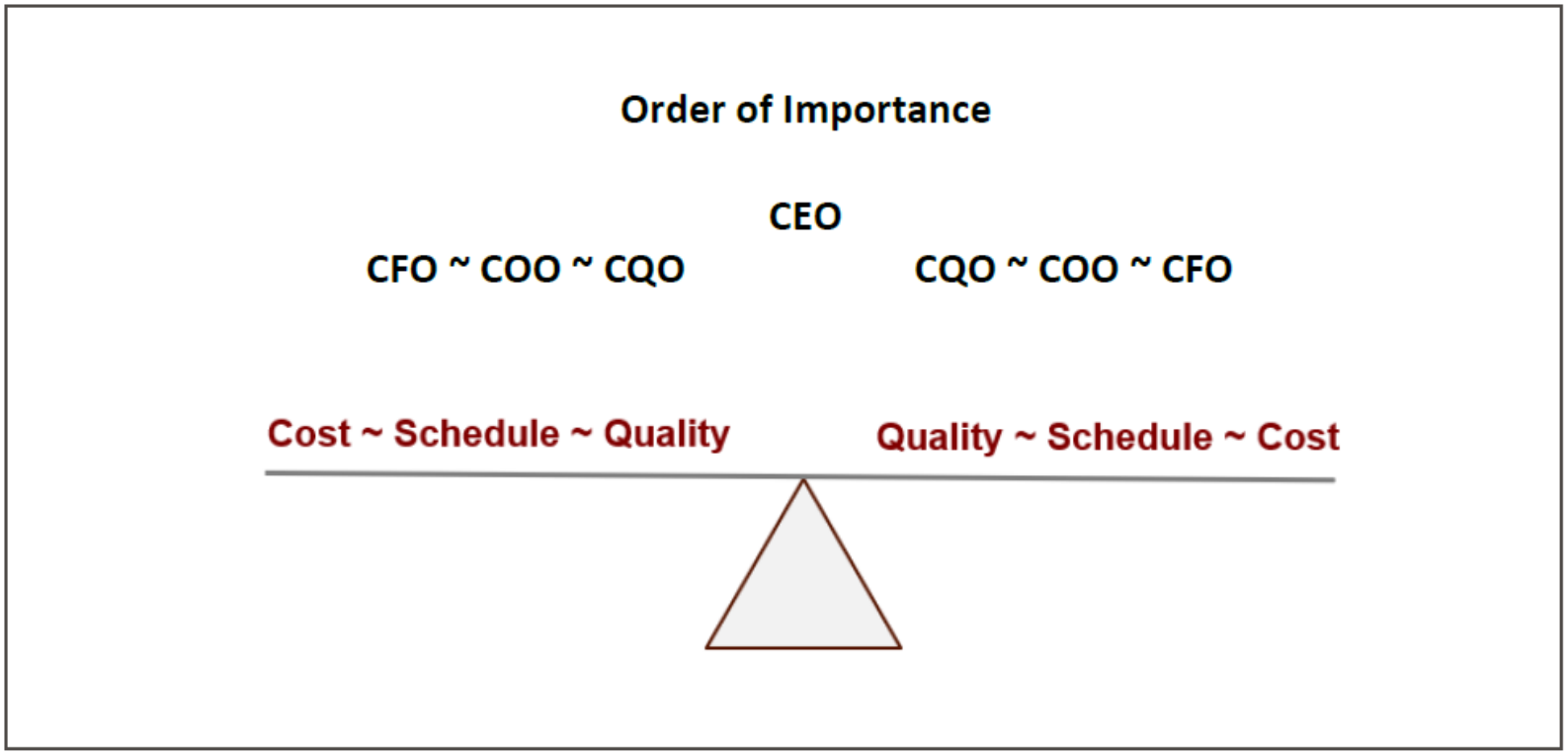
Quality-Related

Nuclear Quality in the C-Suite

- **Does your 'CQO' Report Directly to the CEO? Why Not?**
- **Does your Nuclear Quality Director Report Directly to the COO? Why?**
- **Which Path Represents How Quality Metrics are Reported to Your CEO?**
- **Which Reporting Path, in Your Opinion, is the Most Effective?**



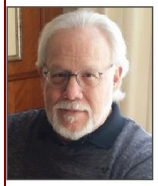
Decision Time



Is Your Lead Quality Professional a C-Suite Member?

SHARE Q

Is There One Common Sense Reason to Keep a CQO Out of Your C-Suite?



Paul W. Gladieux
CEO|CQO|Founder
Global Quality Management Advisors

Scott B. Kaley
Captain (Ret.)|Executive Advisor
Global Quality Management Advisors

Quality Business

NZOQ Issue 1, 2025

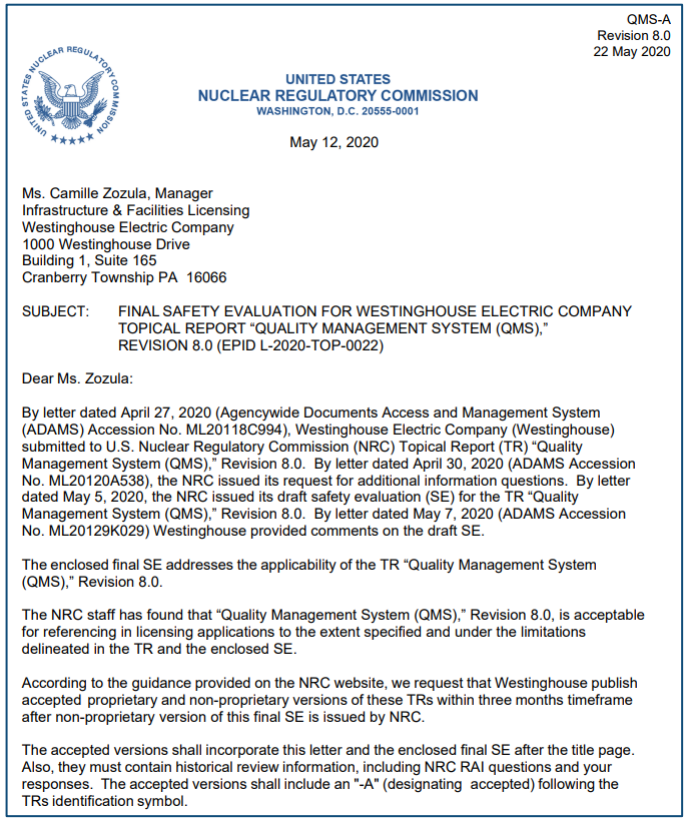
NEW ZEALAND ORGANISATION FOR QUALITY INC
& AUSTRALIAN ORGANISATION FOR QUALITY LTD

https://gqmadvisors.com/wp-content/uploads/2025/03/QB-2025-1-CQO-PWGladieux-SBKaley-03-01-25-11pgs.pdf

NMS ~ ISO 9001 & ISO 19443 N-QMS

Westinghouse Nuclear Adopted ISO 9001 QMS Elements in 1994 as their Nuclear Management System Framework ~ then Integrated Applicable 10CFR50 App. B / ASME NQA-1 Commitments.

- Why Isn't ISO9K The U.S. NMS Framework Model?
- Global Energy Market Requires ISO9K Compliance (cert in some cases).
- ISO 19443 NQMS is Next for the Global Market.



QMS-A
Revision 8.0
22 May 2020

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 12, 2020

Ms. Camille Zozula, Manager
Infrastructure & Facilities Licensing
Westinghouse Electric Company
1000 Westinghouse Drive
Building 1, Suite 165
Cranberry Township PA 16066

SUBJECT: FINAL SAFETY EVALUATION FOR WESTINGHOUSE ELECTRIC COMPANY TOPICAL REPORT "QUALITY MANAGEMENT SYSTEM (QMS)," REVISION 8.0 (EPID L-2020-TOP-0022)

Dear Ms. Zozula:

By letter dated April 27, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20118C994), Westinghouse Electric Company (Westinghouse) submitted to U.S. Nuclear Regulatory Commission (NRC) Topical Report (TR) "Quality Management System (QMS)," Revision 8.0. By letter dated April 30, 2020 (ADAMS Accession No. ML20120A538), the NRC issued its request for additional information questions. By letter dated May 5, 2020, the NRC issued its draft safety evaluation (SE) for the TR "Quality Management System (QMS)," Revision 8.0. By letter dated May 7, 2020 (ADAMS Accession No. ML20129K029) Westinghouse provided comments on the draft SE.

The enclosed final SE addresses the applicability of the TR "Quality Management System (QMS)," Revision 8.0.

The NRC staff has found that "Quality Management System (QMS)," Revision 8.0, is acceptable for referencing in licensing applications to the extent specified and under the limitations delineated in the TR and the enclosed SE.

According to the guidance provided on the NRC website, we request that Westinghouse publish accepted proprietary and non-proprietary versions of these TRs within three months timeframe after non-proprietary version of this final SE is issued by NRC.

The accepted versions shall incorporate this letter and the enclosed final SE after the title page. Also, they must contain historical review information, including NRC RAI questions and your responses. The accepted versions shall include an "-A" (designating accepted) following the TRs identification symbol.

U.S. NRC ADAMS Document Center

https://www.westinghousenuclear.com/Portals/0/about/mission%20vision%20values/QUALITY%20MANAGEMENT%20SYSTEM-A%20(QMS-A).pdf

Nuclear CQO in the C-Suite

- **Is Westinghouse Nuclear the Only Nuclear Company with a CQO? Why?**
- **Without a CQO, which C-Suite Executive 'Automatically Wears the Quality Leadership Hat'? Isn't This a High-Risk Situation?**
- **Without a CQO, How are KPIs & Corrective Actions Addressed / Improved?**
- **Without a CQO, Are Employee Concerns Communicated to C-Suite Members?**
- **Shouldn't Your Quality Director / Manager Report at the Correct Level ~ CQO?**
- **Perhaps it's time to Review the Nuclear Industry Timelines & 'Quality's Path to Leadership.'**

U.S. Commercial Nuclear ~ Quality Management

GQM nuclear advisors

1960 ~ 2025

1970 '79 TMI 1980 1990 2000 2005 2010 2020 2025 2030

Renaissance ~ AP1000 ~ U.S. NuStart Consortium 9 Utilities - Build 30 AP1000 Reactors

Accident Impacted - Design | Fabrication | Build | Startup | Operations <<<< Knowledge Transfer Gap >>>>

U.S. Quality Leaders Emerging
- Dr. Walter A. Shewhart
- Dr. W. Edwards Deming
- Philip B. Crosby
- Dr. Armand V. Feigenbaum
- Dr. Joseph M. Juran

'Conformance to Requirements'
1979 Concept Emerged

1960
Articles & Books on Quality

1960
Major Emphasis on Quality | Safety

1946
ISO Formed

1971
OSHA Regulations

1987
U.S. Reagan | Baldrige Performance Excellence

1987
Project Management Institute (PMI) Formed

Quality Management Systems (QMS)
- 1987 ISO 9001 QMS Standards Released

Quality Management Tools
- SixSigma, QFD, FEMA, PDCA, C&E Diagraming, Mapping, Software, Assessments
- 1995 ISO QMS Certified 75K

Enterprise Software
- Intra- & Internet
- e-QMS
- CMM Site Wide

Integrated Management Systems (IMS)
- IMS, QMS, EMS, RM, SCM, Others
- Requirements Matrix (Advanced)
- Process Hazards Mgt
- Enterprise Software (Advanced)
- Cyber Security
- Supply Chain Mgt (Advanced)
- Post 911 Safety / Security
- 2006 ISO 9001 QMS Certified .6 million, among 155 Countries

2012 ISO 9001 QMS Certified
1.1 mil, among 178 Countries

'Cost of Poor Quality' U.S. Military Supply Chain

ISO 9001 ISO 14001 ISO 45001 ISO 27001 other ISO Management System Certs. ISO 19443 N

Renaissance ~ TBD
- SMRs > 80 Reactor Designers
- MMRs ~ TBD
- LNPPs > 25 Reactor Designs
- Fusion ~ TBD
- CS & AI ~ TBD

1960 ~ 2025
65 Years ~ Will The Gap Close?

Numerous global non-nuclear industry sectors have been implementing ISO 9001 Quality Management Systems & quality tools since 1987. QMS certifications now exceed 1.5 million. Many nations require QMS certification as a part of product / service / system safety-basis certifications.

The U.S. NRC recognized ISO9001:2000 in 2003. This model also suggests the industry may require provisions for implementing "Integrated Management Systems."

2018 ~ New ISO 19443 Nuclear QMS

Will U.S. Nuclear Industry Executives Recognize & Integrate Advanced Quality Management Tools to Enhance Overall Operational Effectiveness?

1950 ~ 2000 LNPP Design | Build Period — 65 LNPP Sites & 100 Power Reactors — 2000 Renaissance ~ LNPP & SMR NPPs

2005 China AP1000 2 NPP Sites w/ 4 Reactors

2008 NuScalePower SMR -TBD

1957
IAEA Founded

App B, Needs Major Upgrade – Requirements Documents & Management of Quality Practices

1970 NRC QA Public Law 10CFR50 Appendix B | U.S 10CFR50 App B | U.S. Reg Guides | U.S. ASME/NQA-1 | U.S ANS 3.2 | CSA Z299 | IAEA-GS-R3

1950
Complex Engineered Products / Systems

1984 Marble-Hill Cancelled $3.2 bil

1984 WH Zimmer Cancelled $ 3.4 bil

Operational ~ Vogtle 3 & 4 AP1K

2017 VC Summer AP1K Cancelled $9 bil

2016 mPower SMR Cancelled $400 mil

1979 Accident Three Mile Island NPP

1986 Accident Chernobyl NPP

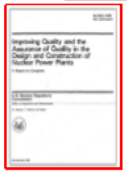
1962
Mil-Q-9858A
UK BS-5750

1971
Industry Standards
ANSI N45.2 – 1971 QA
ANSI N45.2 – 1977 QA
ASME / NQA-1 – 1979 QA

1984 U.S. NRC NUREG-1055 Report to Congress

2011 Accident Fukushima NPP

2010 BP Deepwater Horizon



1987 – ISO 9001 Quality Management Systems

2001 911 Twin Towers

Inspection | Test Era

1965
New Codes / Standards / Regulations

1974
NRC Regulatory Guides

EMS Shift 'Paper Work' to 'Information Work'

Culture
- Safety
- Quality
- Risk
- Security

The U.S. chemical, oil, and gas industries have a history of QC, Inspection, & Testing as the methods for ensuring safety & specification compliance. In the mid-'60s, the nuclear industry initiated QA with the goal of "error prevention."
- Is the new generation of professionals well trained in U.S. NRC 10CFR50, App. B & ASME NQA-1 Quality Management Requirements?
- Does the nuclear industry recognize the 'Management of Quality' & its focus is driven by company executives & safety-related items?
- Do executives recognize & embrace advanced 'Quality Management Tools' available to enhance, safety, effectiveness, & compliance?
- Will industry members realize the benefits by unconditional Quality Management support?

Quality Control Programs

Quality Assurance Programs

RGs / Codes / Standards
Audits / Assessments / Oversight

QA, QC, Test, Supply Chain Management

Quality Engineering, Design Assurance

Quality Management Systems

Enterprise Management Software

Robotics

Integrated Management System

Cyber Security | AI

Paul W. Gladieux ~ CEO | CQO | Founder

1960 QA | 1970 QE | 1980 QM | QMS 1990 EMS | 2000 IMS | 2010 Culture | 2020 CS | AI | 2030

GQMadvisors NMS-MNQ TmLn 04-09-25, R1 Fig 2

MADE IN USA

Quality Control | Quality Assurance | Quality Management | Quality Leadership

GQM advisors

QC | QA | QM | QL

Quality's Path to Leadership

1900 ~ 2020

Quality Affecting Significant Events

- 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)
- 2020 Coronavirus Pandemic Global COVID19

Quality Management Tools

Risk Mitigation, SixSigma, QFD, FEMA, PDCA, C&E Diagraming, SPC, Control Charts, Remote Audits, Design / Contract Assurance, Lean, Process Mapping, Software, Modeling, Self-Assessments, CAPA, Drone Site Monitoring, Robot Inspections, Cyber Security, Others

Conformance to Requirements

"Quality is Free concept 1979"

Dr. Philip B. Crosby

U.S. Quality Leaders Emerge

- Dr. Walter A. Shewhart
- Dr. Armand V. Feigenbaum
- Dr. Joseph M. Juran
- **Dr. W. Edwards Deming's Period of Influence**
  - 'System of Profound Knowledge'
  - Encompassed System, Variation, Knowledge, Psychology
  - 4 Lenses of Reference

2000 Work Cultures Emerge as Key Element to QMS Effectiveness

1990 Shift from 'Error Detection' to 'Error Prevention'

1990 U.S. Dept of Navy CNO Enacted Total Quality Leadership Concepts & Practices to Selected Fleet Units. *Goal: Process Improvements.* (1)

Quality Leadership

Who's Your ~ Chief Quality Officer ?

1977 DOE Formed

1971 OSHA Formed

Quality Assurance Emerges

1958 NASA & DARPA Formed

1957 First U.S. Nuclear Power Plant

"Cost of Poor Quality" U.S. Military Suppliers

Increased Emphasis on Quality | Safety

Inspection / Testing

Mass Production

1913, U.S. DOL Created

World War II

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

1907, 60 Workers Died in Pittsburgh Factories

1884, U.S. BLS Collects Data

1987 Quality Management Systems (QMS)

- ISO 9001 QMS Certifications 1.4 Million
- U.S. Baldrige Quality Performance Program (Department of Commerce)
- Quality Management Consultants

Management Systems Industry & Government - Driven

- Environmental / Health / Safety Mgt
- Enterprise / Information Mgt
- Integrated Mgt
- Requirements Mgt
- Risk Mgt
- Emergency Prep Mgt
- Supply Chain Mgt
- Process Hazards Mgt
- Cybersecurity Mgt

QRs

Quality Management

Complex Software

Quality Assurance

Complex Engineered Products / Systems / Structures

QC / SPC In - Process Inspection

Quality Control

Self - Inspection

Productivity Studies (SPC)

Exxon Valdez, Prince William Sound 1989 Oil Tanker Spill, Alaska, U.S.

911, Twin Towers, U.S. 2001

Challenger Shuttle, U.S. 1986 Accident

Columbia Shuttle, U.S. 2003 Accident

Chernobyl, Russia Nuclear Power Plant 1986 Accident

BP Deepwater Horizon, UK 2010 Oil Spill

Three Mile Island, U.S. Nuclear Power Plant 1979 Accident

Fukushima Daiichi, Japan Nuclear Power Plant 2011 Accident

Quality 4.0 ~ Digital ASQ

COVID-19 Global Pandemic

QRs Quality Requirements

1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040 2050

(1) https://gqmadvisors.com/wp-content/uploads/2020/03/U.S.-Dept-Of-The-Navy-TQL-In-The-Fleet-Theory-to-Practice-J.Wasik-B.Ryan-1993-AD-A275-444-92pgs.pdf

https://gqmadvisors.com/disciplines/

We Have Extensive Mastery of The Four Quality Disciplines

Quality Leadership (QL) The Department of the Navy's definition of QL is based on Dr. 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." U.S. Depart Of The Navy TQL In The Fleet Theory to Practice, J.Wasik, B.Ryan, 1993, AD-A275 444 92pgs.

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).

GQM Nuclear Advisors ~ Mastery

GQM ADVISORS WAS FOUNDED IN 1991 on the belief the "Management of Quality is a fundamental responsibility of everyone engaged in the delivery of products & services." We are a group of leading Independent Quality-focused Professionals with a reputation of mastery & excellence in deploying the Four Quality Disciplines > QL, QM, QA, & QC. The Group understands that all business disciplines must be quality-focused for an organization to achieve annual goals & objectives delineated in its Quality Management System (QMS).

Arizona	Nevada	Tennessee
California	New Jersey	Texas
Colorado	North Carolina	Utah
Florida	Ohio	Virginia
Georgia	Oregon	Washington
Michigan	South Carolina	Washington, DC
	Canada	
	Netherlands	
	United Kingdom	

https://gqmadvisors.com/professional-resources/advisors/

Advisors collective expertise exceeds 1,000 years encompassing more than 50 Business Sectors | Segments | Applications. Our established relationships in various industries, societies, agencies, business peer groups, & supply chains enables us to align the never-ending mix of management systems baseline requirements in virtually any operation and program environment. Our experiences vary & span a 50-year period beginning in the early 1970s.

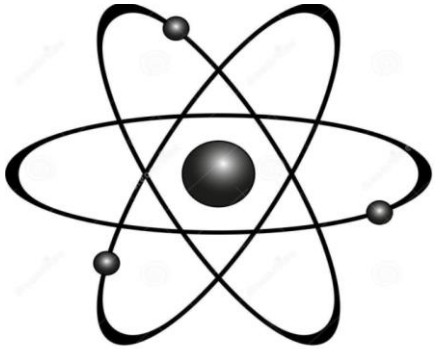
Nuclear Quality Management Advisors

Nuclear Management Systems

~ Focused on Quality ~

Paul W. Gladieux
CEO | CQO | Founder
Lynchburg, VA USA
503-939-4498 C

34 Years ~ Serving Clients



Since 1974

https://gqmadvisors.com/