60 Minutes ~ Lessons Learned

U.S. Nuclear Renaissance

‘Show Stoppers’

Content from GQM Nuclear Advisors
‘Nuclear Management Systems’ Course

GQM nuclear advisors

Nuclear

Safety-Related

=

Quality-Related

U.S. Nuclear Renaissance ~ 2025

Don't Let 'Show Stoppers' Disrupt Your Reactor & Site Design | Build | Startup Plans & Upset Your Investors!

Please ~ Do Not Ignore the NRC Cornerstone Regulations for 'The Management of Nuclear Quality'

1st Fleet Nuclear Quality Management Professionals Know How to 'Prevent Your Show from Stopping'

‘Show Stoppers’

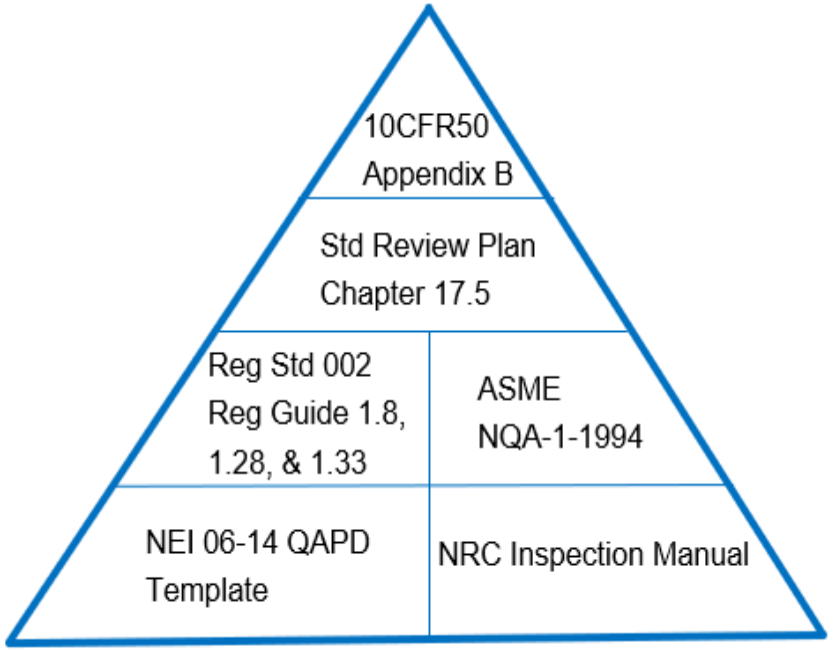
- **Lack of C-Suite Executives Establishing Nuclear-Related Policies for Flowdown**
- **Lack of an Effective Nuclear Management System**
  - Effective Nuclear Quality Assurance Program Encompassing U.S. NRC 10CFR50, Appendix B
  - Accurate Scope Encompassing All Safety & Quality-Related Structures, Systems, Components (SSCs)
  - Effective Requirements & Configuration Management Strategies & Processes
- **Lack of Effective Enterprise-wide Training & Certifications as Required**
- **Lack of Strong Engineering Control / Oversight for All Safety | Quality-Related Aspects**
  - Engineering is The Specifying Organization ~ Sets & Controls the Design Safety Basis
- **Lack of a High-Performing Nuclear Information Program (Doc/Rec Adm. Controls)**
- **Poor Communications & Requirements Flowdown Among the Supply Chain**
- **Clear Evidence of Cost & Schedule Priorities over Quality**
- **Major Inconsistencies in Knowing Quality Principles, Practices, Processes, Procedures**

U.S. Nuclear Energy Regulations

U.S. Public Health & Safety ~ 1970 New Energy Segment

'Complex Systems | High Consequence'

- **1946 U.S. Atomic Energy Commission ~ AEC**
- **1954 U.S. Congress ~ Atomic Energy Act**
  - Commercial Nuclear Power Now Possible
- **1971 U.S. 10CFR50, Appendix A ~ Design**
- **1970 U.S. 10CFR50, Appendix B ~ Quality**
- **1974 U.S. Congress Energy Reorganization Act**
  - AEC Programs Under Strong Attack ~ Abolished
  - Created Nuclear Regulatory Commission (NRC)
- **1975 U.S. Nuclear Regulatory Commission ~ NRC**



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U.S. NRC Regulation 10CFR50, App. B

Appendix B To Part 50—Quality Assurance Criteria For Nuclear Power Plants And Fuel Reprocessing Plants | NRC.gov

Appendix B to Part 50—Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants

Introduction. Every applicant for a construction permit is required by the provisions of § 50.34 to include in its preliminary safety analysis report a description of the quality assurance program to be applied to the design, fabrication, construction, and testing of the structures, systems, and components of the facility. Every applicant for an operating license is required to include, in its final safety analysis report, information pertaining to the managerial and administrative controls to be used to assure safe operation. Every applicant for a combined license under part 52 of this chapter is required by the provisions of § 52.79 of this chapter to include in its final safety analysis report a description of the quality assurance applied to the design, and to be applied to the fabrication, construction, and testing of the structures, systems, and components of the facility and to the managerial and administrative controls to be used to assure safe operation. For applications submitted after September 27, 2007, every applicant for an early site permit under part 52 of this chapter is required by the provisions of § 52.17 of this chapter to include in its site safety analysis report a description of the quality assurance program applied to site activities related to the design, fabrication, construction, and testing of the structures, systems, and components of a facility or facilities that may be constructed on the site. Every applicant for a design approval or design certification under part 52 of this chapter is required by the provisions

'The Show Stopper'

- **Lack of an Effective Nuclear Management System**
  - Lack of an Effective Nuclear Quality Assurance Program Encompassing U.S. NRC 10CFR50, Appendix B
  - Accurate Scope Encompassing All Safety & Quality-Related Structures, Systems, Components (SSCs)
  - Effective Requirements & Configuration Management Strategies & Processes

U.S. NRC 10CFR50, Appendix B, 18 Criteria, *States in Part,,,,,,,*

II. Quality Assurance Program

https://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-appb.html

The applicant shall establish at the earliest practicable time, consistent with the schedule for accomplishing the activities, a quality assurance program which complies with the requirements of this appendix. This program shall be documented by written policies, procedures, or instructions and shall be carried out throughout plant life in accordance with those policies, procedures, or instructions. The applicant shall identify the structures, systems, and components to be covered by the quality assurance program and the major organizations participating in the program, together with the designated functions of these organizations. The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety. Activities affecting quality shall be accomplished under suitably controlled conditions. Controlled conditions include the use of appropriate equipment; suitable environmental conditions for accomplishing the activity, such as adequate cleanness; and assurance that all prerequisites for the given activity have been satisfied. The program shall take into account the need for special controls, processes, test equipment, tools, and skills to attain the required quality, and the need for verification of quality by inspection and test. The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained. The applicant shall regularly review the status and adequacy of the quality assurance program. Management of other organizations participating in the quality assurance program shall regularly review the status and adequacy of that part of the quality assurance program which they are executing.

Definitions and Discussions – Quality Management

Quality Management (QM), Quality Assurance (QA), and Quality Control (QC) each reference a distinct aspect in the focus of the NRC inspection staff.

Quality Management is a *systematic approach* to ensure customer and *performance results* meet their expectations.

QM establishes processes to ensure and measure customer satisfaction.

What is the Baldrige award?

How do its criteria affect present-thinking regarding QM?

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

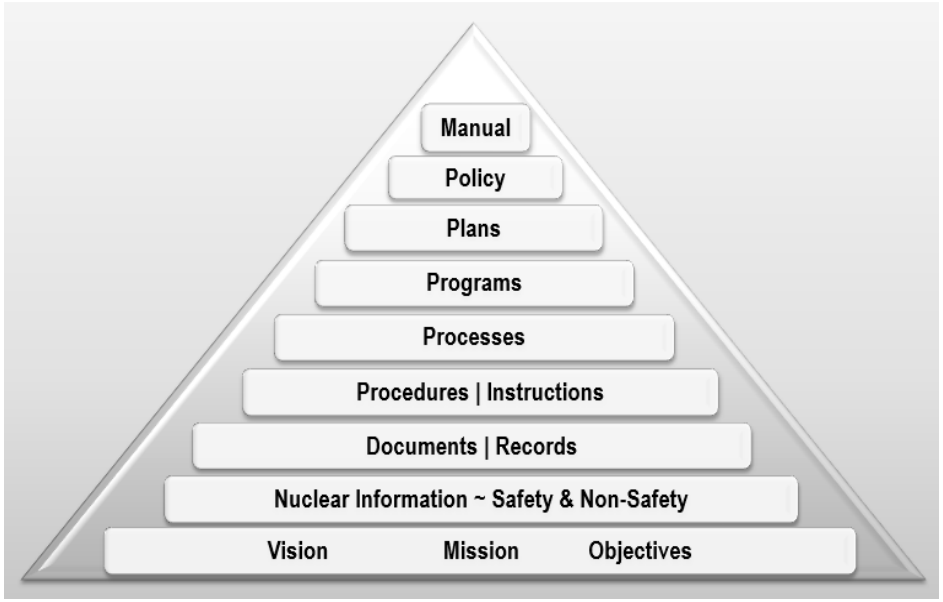
29

Executives | Engineers | Program Management

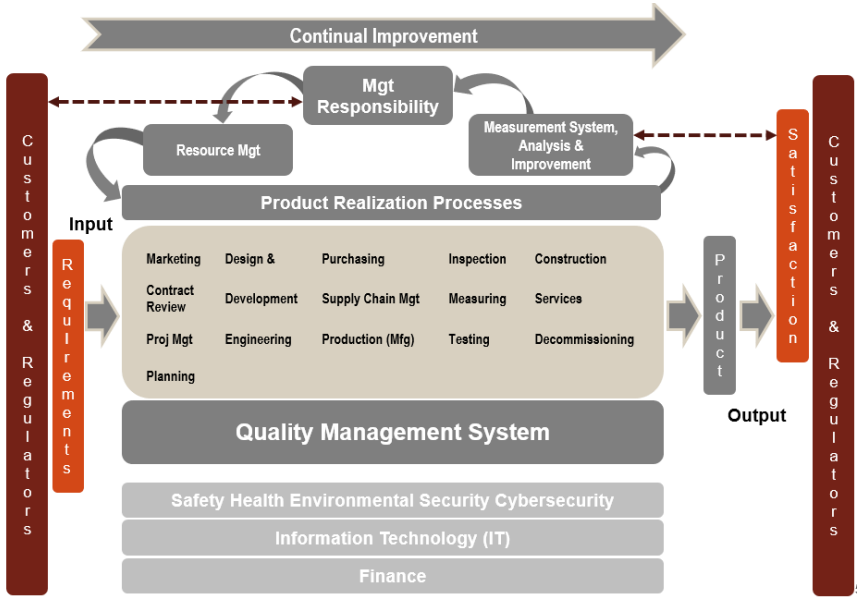
- Form Your Nuclear Management Team ~ Early
- Study & Understand Applicable Requirements Documents ~ Early
- Promote Quality Management Concept of ‘Quality is Conformance to Requirements’
- Design Your Organization & Assign Roles | Responsibilities ~ Early
- Ensure Engineering Defines Safety | Quality Parameters ~ Effectively
- Implement Robust Nuclear Information Management Processes ~ Early
- Engage Your Critical Suppliers ~ Early
- Conduct Enterprise-wide Training & Gain Certifications ~ Early
- Ensure Your Nuclear Quality Professionals Demonstrate Mastery in the Disciplines
- Promote Excellence in Communications & Information Controls
- Set & Unconditionally Endorse Clear Quality Management Policies & Practices ~ Early

Management Team ~ Design Your System & Programs

- **U.S. NRC 10CFR50, App. B '18 Criteria' (ASME NQA-1, Applicable Ed.)**
- **ISO 9001 QMS '10 Management System Elements' ~ Process-based**
- **Understand Your Commitments ~ Resource Adequately**



18 Functional Requirements



10 Management System Elements

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Regulations, Standard Review Plan, SECY Paper, And NUREG-1055 | NRC.gov

Regulations, Standard Review Plan, SECY Paper, and NUREG-1055 Regarding Quality Assurance for New Reactors

The "Quality Assurance Criteria for Nuclear Plants and Fuel Reprocessing Plants," set forth in **Appendix B** to Title 10, Part 50, of the *Code of Federal Regulations* (10 CFR Part 50), must be implemented for activities affecting safety-related plant equipment. Licensees are also required to develop, and control changes to, their quality assurance (QA) programs, as stated in 10 CFR 50.54(a)(1). In addition, 10 CFR 50.34(b)(6)(ii) requires that a licensees' description of its QA program for a nuclear power plant must include a discussion of how the applicable requirements of Appendix B will be satisfied. For detail, see the following topics:

- ***Code of Federal Regulations***
- **Standard Review Plan (NUREG-0800)**
- **SECY Paper**
- **NUREG-1055**
- **10 CFR Part 21 Clarification and Rulemaking**

U.S. NRC CFRs ~ Quality-Related

GQM nuclear advisors

Regulations, Standard Review Plan, SECY Paper, And NUREG-1055 | NRC.gov

Code of Federal Regulations

Part	Subject
Appendix A to 10 CFR Part 50	General Design Criteria
Appendix B to 10 CFR Part 50	Main QA Regulation
10 CFR Part 21	Reporting of Defects and Noncompliance (Last updated July 6, 2012)
10 CFR 50.4(b)(7)	Written Communications - Quality Assurance Related Submittals
10 CFR 50.34(b)(6)(ii)	QA Program Description
10 CFR 50.34(f)(3)(ii) and 10 CFR 50.34(f)(3)(iii)	Requirements Related to the Incident at Three Mile Island (TMI) (I.F.1 and I.F.2)
10 CFR 50.36(c)(5)	Administrative Controls
10 CFR 50.54(a)(1)	QA Program Requirement
10 CFR 50.54(a)(2)	Submittal of QA Program Description
10 CFR 50.54(a)(3)	QA Program Description Change Control
10 CFR 50.54(a)(4)	Reductions in Commitments in QA Program
10 CFR 50.55(e)	Evaluation of Defects & Failures To Comply Associated w/ a Substantial Safety Hazard
10 CFR 50.55a	Codes and Standards
10 CFR 50.71(e)	Maintenance of Records
10 CFR 52.17(a)(xi)	QA Program Description (Early Site Permits)
10 CFR 52.47(a)(8)	TMI-Related Requirements (Design Certifications)
10 CFR 52.47(a)(19)	QA Program Description (Design Certifications)
10 CFR 52.79(a)(17)	TMI-Related Requirements (Combined Licenses)
10 CFR 52.79(a)(25)	QA Program Description (Combined Licenses)

U.S. NRC ~ SRP NUREG-0800

NUREG-0800 | NRC.gov

Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants:

LWR Edition (NUREG-0800, Formerly issued as NUREG-75/087)

Both current and previous versions of the Standard Review Plan (SRP) are publicly available in the Agencywide Documents Access and Management System (ADAMS) and can be accessed through this Web site using the Table of Contents or the chapter-specific pages listed below. This SRP was previously issued as NUREG/75-087 (PDF – 8.47 MB). Please Contact Us if you have questions or comments regarding the SRP.

Section	Title	Rev.	Date Updated
17.1	Quality Assurance During the Design and Construction Phases	Rev. 2	07/1981
17.2	Quality Assurance During the Operations Phase	Rev. 2	07/1981
17.3	Quality Assurance Program Description	Rev. 0	08/1990
17.5	Quality Assurance Program Description - Design Certification, Early Site Permit, and New License Applicants	Rev. 1	08/2015

U.S. NRC ~ SRP NUREG-0800, cont'd.

NUREG-0800 | NRC.gov

Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants:

LWR Edition (NUREG-0800, Formerly issued as NUREG-75/087)

- Cover, Table of Contents, and Introduction
- Chapter 1, Introduction and Interfaces
- Chapter 2, Sites Characteristics and Site Parameters
- Chapter 3, Design of Structures, Components, Equipment, and Systems
- Chapter 4, Reactor
- Chapter 5, Reactor Coolant System and Connected Systems
- Chapter 6, Engineered Safety Features
- Chapter 7, Instrumentation and Controls
- Chapter 8, Electric Power
- Chapter 9, Auxiliary Systems
- Chapter 10, Steam and Power Conversion System
- Chapter 11, Radioactive Waste Management
- Chapter 12, Radiation Protection
- Chapter 13, Conduct of Operations
- Chapter 14, Initial Test Program and ITAAC-Design Certification
- Chapter 15, Transient and Accident Analysis
- Chapter 16, Technical Specifications
- Chapter 17, Quality Assurance
- Chapter 18, Human Factors Engineering
- Chapter 19, Severe Accidents
- Appendices
- Bibliographic Data Sheet

U.S. NRC SECY & NUREG – Quality-related

NRC: Package ML031490306 -SECY-03-0117 - Approaches for Adopting More Widely Accepted International Quality Standards

SECY Paper, ISO 9001 Quality Management System

The staff of the U.S. Nuclear Regulatory Commission (NRC) performed a review of international QA standards (ISO 9001-2000) against the existing framework of Appendix B to 10 CFR Part 50, and assessed approaches for adopting international quality standards for safety-related components in nuclear power plants into the existing regulatory framework. This review is documented in SECY-03-0117.

- ML031490421 - SECY-03-0117 - Approaches for Adopting More Widely Accepted International Quality Standards (20 page(s), 7/9/2003)
- ML031490463 - SECY-03-0117-Attachment-Comparison of Appendix B to ISO 9001-2000 (8 page(s), 7/9/2003)

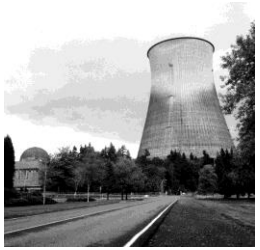
https://www.nrc.gov/docs/ML0630/ML063000293.pdf

NUREG-1055-1984, Study at the Request of Congress

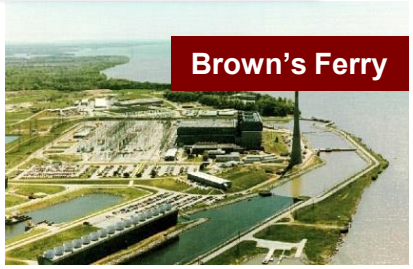
At the request of Congress, NRC conducted a study of existing and alternative programs for improving quality and the assurance of quality in the design and construction of commercial nuclear power plants.

Study at the Request of Congress, NUREG-1055

- **H.R. 2330 Bill authorizing appropriations to the NRC in accordance with Section 261 of the Atomic Energy Act of 1954**
- **H.R. 2330 became Public Law 97-415 also known as the NRC Authorization Act for fiscal years 1982-'83**
  - **To Conduct a Study of Existing & Alternative Programs for Improving Quality & the Assurance of Quality in the Design & Construction of NPPs**
- **Ford Amendment adding Section 13(b) outlining the specifics of the study**
  - Introduced by Senator Wendell Ford of Kentucky
  - Cosponsored by Senators Simpson, Mitchell, Levin, Hart
  - Outlined five alternatives referred to as alternatives b(1) - b(5)



U.S. Events Leading to The Study



Brown's Ferry **Incident** in 1975

Three Mile Island **Accident** in 1979

Construction Contractors Issued SWOs & SCOs

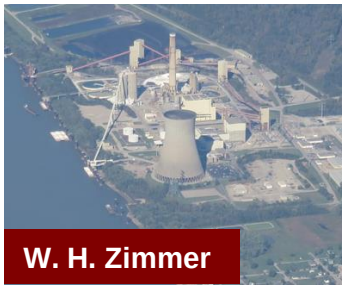
Investigations – Policy, Procedure, Specification Non-conformances

Construction Problems in '70s such as Marble-Hill & W. H. Zimmer

Licensees Unable to Demonstrate Plant Built to All Requirements
Marble-Hill & W. H. Zimmer Cancelled

Reports of Schedule Precedence Over Quality

Reports Lowered Trust that Plants were being Built per Regulations, Codes, Standards to ensure Safety & Quality



U.S. Study ~ Seven NPP Sites 1982 - '83

Scope ~ Licensee Design | Build Programs

Build Program	Case Study	Major Quality Problems	Utility	Online Dates
Marble Hill Cancelled	A	Yes	Public Service of Indiana	Proposed 1973. $2.2 billion failed design/build program closed 1984
St. Lucie 2	B	No	Florida Power & Light	R1 03/01/76 R2 06/10/83
Diablo Canyon	C	Yes	Pacific Gas & Electric	R1 05/07/85 R2 03/13/86
South Texas	D	Yes	Houston Lighting & Power	R1 08/25/88 R2 06/19/89
Vogtle 1 & 2	E	No	Georgia Power	R1 06/01/87 R2 05/20/89
Palo Verde	F	No	Arizona Public Service	R1 01/28/86 R2 10/19/86 R3 01/08/88
W. H. Zimmer Cancelled	G	Yes	Cincinnati Gas & Electric	Proposed 1969. $3.4 billion failed design/build program converted to coal 1984

U.S. Study ~ Deficiencies

https://www.nrc.gov/docs/ML0930/ML093020509.pdf

What Were The Deficiencies?

Per NUREG-1055, quality of structures, systems, and components was indeterminate due to:

- Inadequate quality inspection documentation
- Inadequate reporting of nonconformances
- Drawing deficiencies
- Inadequate specifications
- Materials control deficiencies
- Inadequate procedures and instructions
- Procedure violations
- Inadequate licensee audits
- Inadequate corrective action program

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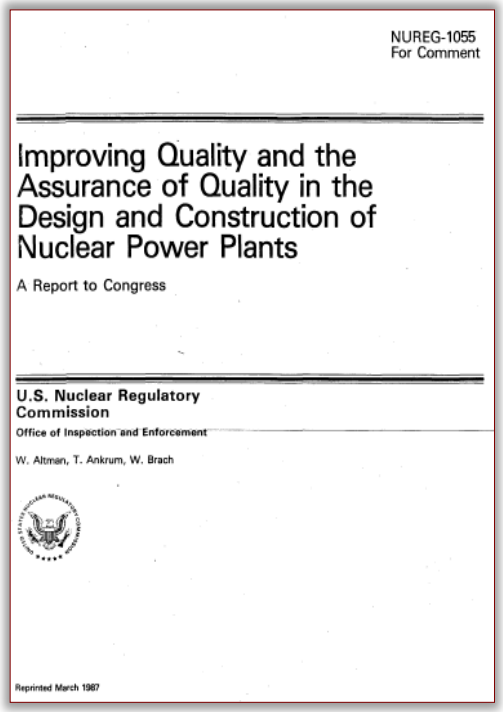

NUREG-1055
For Comment

Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants

A Report to Congress

U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement

W. Altman, T. Ankrum, W. Brach

Reprinted March 1987

U.S. Study ~ Deficiencies

https://www.nrc.gov/docs/ML0930/ML093020509.pdf

What Are The Deficiencies?

What is being observed in current construction efforts:

- Inadequate QC Documentation
- Inadequate reporting of nonconformances
- Drawing deficiencies
- Inadequate specifications
- Materials control deficiencies
- Inadequate procedures and instructions
- Procedure violations
- Inadequate licensee audits
- Inadequate corrective action program

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Protecting People and the Environment

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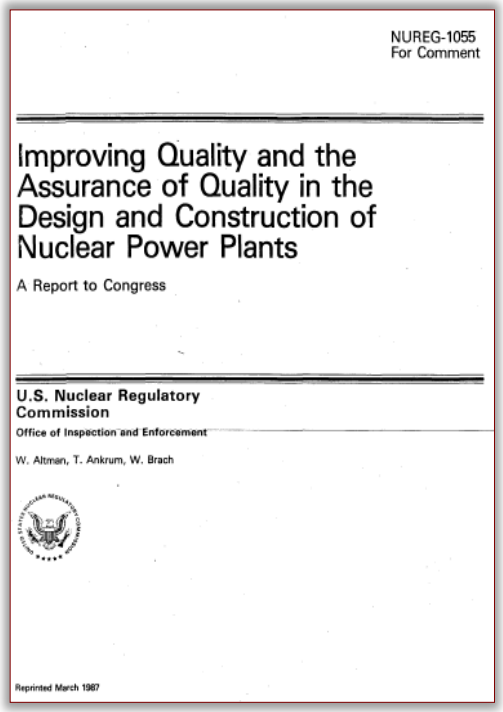

NUREG-1055
For Comment

Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants

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Reprinted March 1987

U.S. Study ~ Deficiencies

https://www.nrc.gov/docs/ML0930/ML093020509.pdf

What Are The Deficiencies?

What is being observed in current construction efforts:

- Vendors inexperienced in nuclear environments
- Construction craft and contractors inexperienced in nuclear environments
- Difficulty managing multiple design control processes
- Difficulty managing multiple problem identification and resolution (PI&R) programs
- Procurement specification issues – beyond code but not enforcing
- Vendor oversight challenges
- Insufficient QA personnel for oversight activities
- Lack of Commercial Grade Dedication understanding
- Lack of 10 CFR Part 21 understanding

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Protecting People and the Environment

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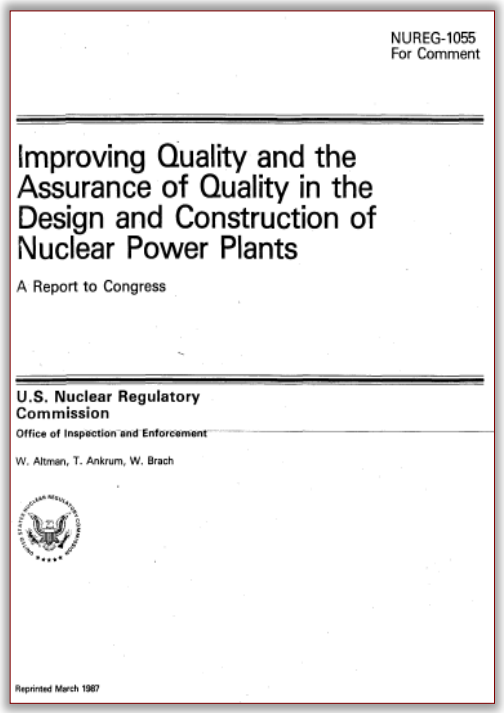

NUREG-1055
For Comment

Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants

A Report to Congress

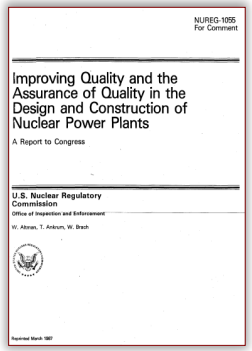
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement

W. Altman, T. Ankrum, W. Brach

Reprinted March 1987

U.S. Study ~ Critical Deficiency

U.S. NRC 10CFR50, Appendix B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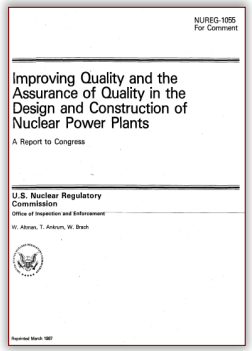
Office of Inspection and Enforcement

W. Abnas, T. Ankrum, W. Brach

Reprinted March 1987

"**Early training to Appendix B of 10CFR50** was through on-the-job-training with experienced personnel. **In 1975, training in App B consisted of self-reading.** In 1976, one hour of a fragmented course whose schedule was diverted by the class, was allocated to App B. **A longer formalized course was not developed until 1983. During the study, it was stated there is a great need for more training in Quality Assurance, Standards, & App B of 10CFR50.** It was also stated that there was practically no training in how to apply modules or how to do inspections. These skills come mainly from on-the-job-training. More training is needed to improve the caliber & qualifications of inspectors."

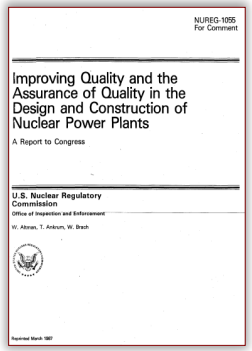
U.S. NRC Report to Congress ~ 1984



The Study Conclusion

A primary focus of the study was to determine the underlying causes of **major quality-Related problems** in the design & construction of some nuclear power plants & the untimely detection & correction of these problems. **The study concluded that the root cause for major quality-related problems was the failure or inability of some utility management to effectively implement a management system that ensured adequate control over all aspects of the project.** These management shortcoming arose in part from inexperience on the part of some project teams in the construction of nuclear power plants. In addition, NRC's past licensing and inspection practices did not adequately screen construction permit applicants for overall capability to manage or provide effective management oversight over the construction project.

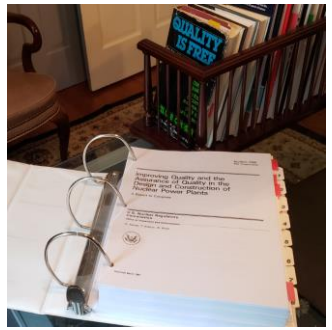
U.S. NRC Report to Congress ~ 1984



The Study Recommendations

The study recommends self-imposed rising standards of excellence, treatment of quality assurance as a management tool, not a substitute for management, improved trend analysis & identification of root causes of quality problems, & a program of comprehensive third-party audits of present & future construction projects. To improve NRC programs, the study recommends a heavier emphasis on team inspections & resident inspectors, an enhanced review of new applicant's capabilities to construct commercial nuclear power plants, more attention to management issues, improved diagnostic & trending capabilities, improved quality & quality assurance for operating reactors, & development of guidance to facilitate the prioritization of quality assurance measures commensurate with the importance of plant structures, systems, & components to the achievement of safety.

The Show Stopper?



During the U.S. 1st Fleet

Design & Build Era 1970 ~ 1990

Show Stopper ~ "Was the Failure or Inability of Some Utility Management to Effectively Implement a Management System that Ensured Adequate Control Over All Aspects of the Project"

~ Poor Management of Nuclear Quality ~

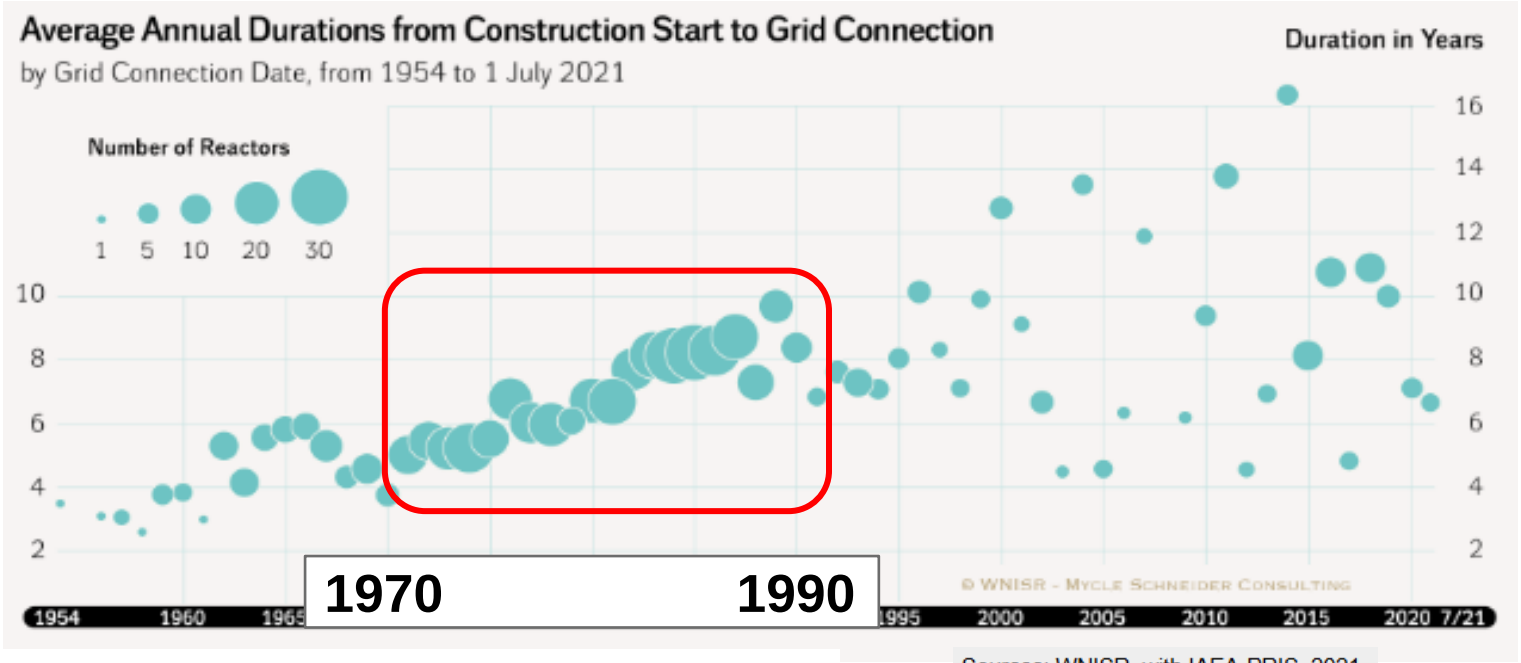
"Those Who Cannot Remember the Past are Condemned to Repeat It"

Glenn M. Tracy, NRC

1970 ~ 1990

Executives ~ Implement Your Nuclear Mgmt. System Early

- **Form Your Nuclear Management Team ~ Early**
- **Implement Your 10CFR50, App. B–based NMS | QA & QC Programs ~ Early**
- **I see the next massive build period beginning in 2030 > > ?**
- **Remember ~ 'the applicant shall establish at the earliest practicable time, consistent with the schedule……. (slide 7)'**



2030

https://www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2021-HTML.html

Sources: WNISR, with IAEA-PRIS, 2021

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

1962
Mil-Q-9858A
UK BS-5750

1979 Accident Three Mile Island NPP

1986 Accident Chernobyl NPP

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

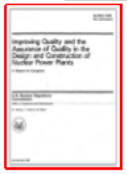
2011 Accident Fukushima NPP

2010 BP Deepwater Horizon

Inspection | Test Era

1965
New Codes / Standards / Regulations

1974
NRC Regulatory Guides



1987 – ISO 9001 Quality Management Systems

2001
911 Twin Towers

EMS Shift 'Paper Work' to 'Information Work'

Culture
- Safety
- Quality
- Risk
- Security

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

- 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?

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."

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

Questions?

1. In your opinion, are your top management, program management-level, workforce, & suppliers committed to unconditionally executing your Nuclear Quality Management Policy?

2. Are all employees committed to Company Policies, Processes, & Procedures?

3. Do you have access to the Nuclear Management System (QA Program)?

4. Have you attended training on Nuclear Quality Management, Four Disciplines QL/QM/QA/QC, 10CFR50 App A & B, 10CFR Part 21, ASME/NQA-1, ISO9001, ISO19443, ASME Codes, NPP Licensing, Nuclear Safety Culture, Employee Concern & Corrective Action Programs, etc.?

5. Do you feel confident in understanding the requirements as they apply to your daily programs/projects/activities/tasks & flowdown requirements to suppliers?

6. Does your management unconditionally endorse the Employee Concern Program or are you working in “chilled” work environment?

7. Do you feel confident in submitting a formal Employee Concern to your management?

You’re welcome to share answers with Professionals at GQM Advisors. Simply state yes or no in a message using our Web Contact page https://gqmadvisors.com/contact/ or Email to paul@gqmadvisors.com

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.

Is Your C-Suite Aware of 10CFR50, App. B & ASME/NQA-1 Audit / Assessment Processes?

If NOT Contact

john@jetsquality.com

J-E-T-S QUALITY CONSULTANTS INC.

Nuclear Training Company | J-E-T-S Quality Consultants (jetsquality.com)

Free Audit & Assessment Help | Jets Quality Consultants

Is Your C-Suite Aware of Their Roles in U.S. NRC 10CFR50, App B & 10CFR Part 21?

If NOT Contact

https://beriassociates.thinkific.com/pages/about-beri-associates

https://beriassociates.thinkific.com/collections

Is Your C-Suite Aware of ISO19443 Nuclear Energy-Specific Requirements?

If NOT Contact

Nuclear CC
Futureproofing your company

Nuclear CC - Consultancy in the nuclear and manufacturing industry

List of ISO 19443 Certified Companies (nqsa.org)

Does Your C-Suite Operate from A Risk Mitigation Standpoint?

If NOT Contact

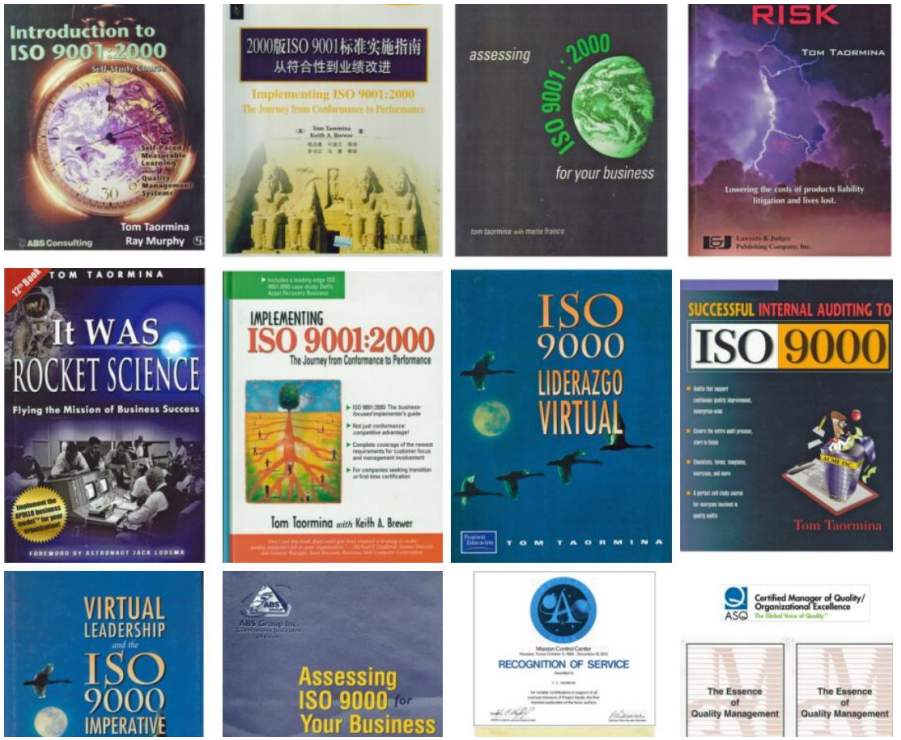
Quality + Engineering (qualityplusengineering.com)

Is Your C-Suite Aware of The ISO9001 Management System Framework Model?

If NOT Contact

Taormina Group

Tom Taormina | LinkedIn



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).

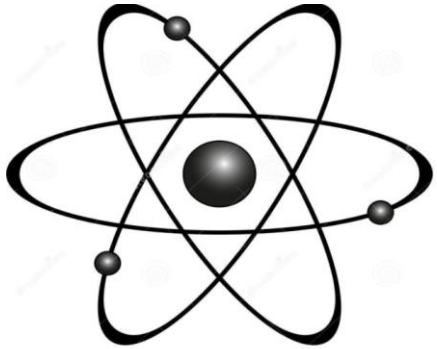
Nuclear Quality Management Advisors

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

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