

Global Quality Management Advisors



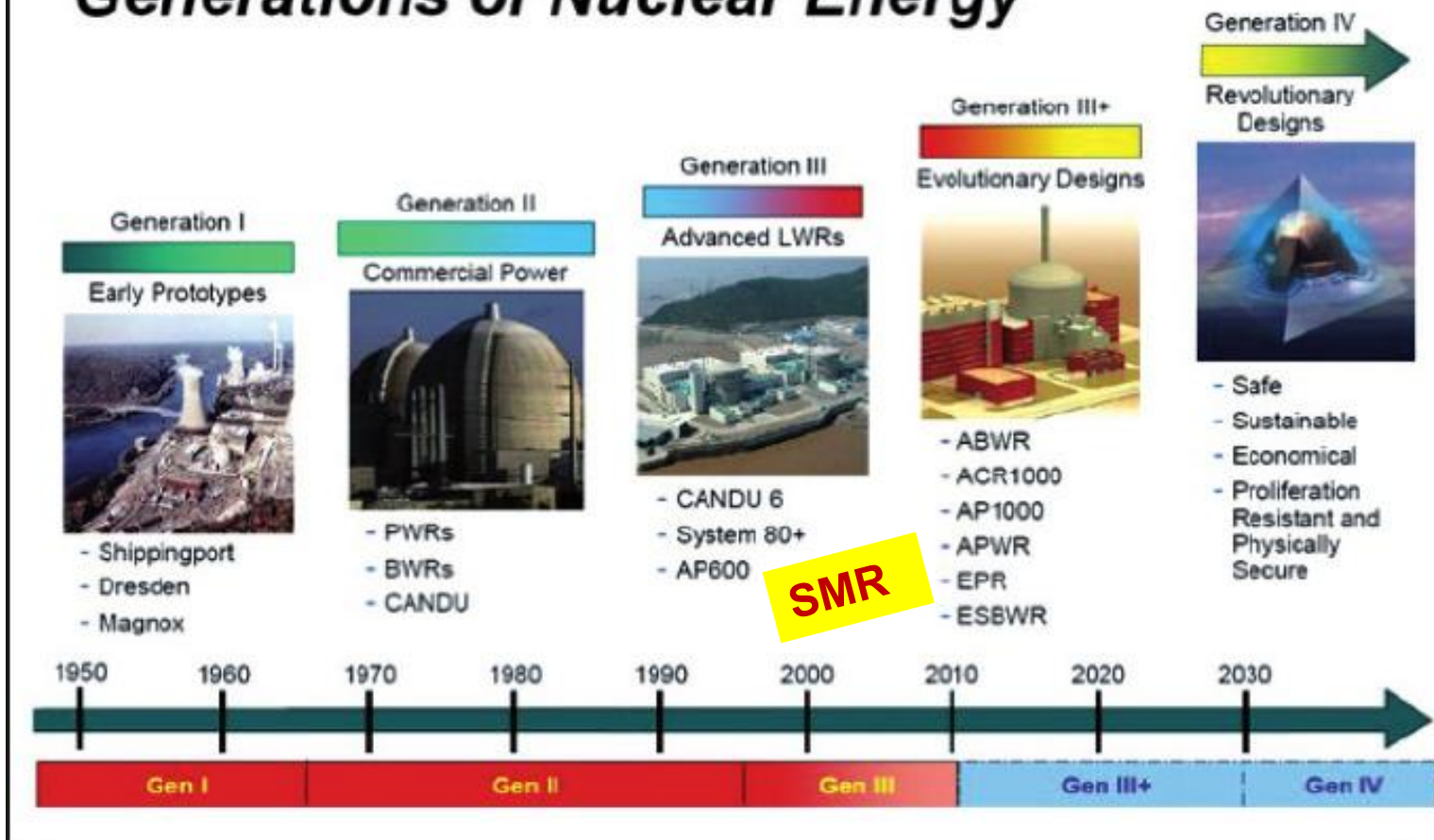
Global Nuclear Energy

The Race 2017

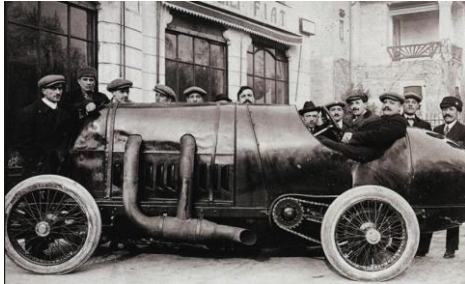
Research | Commitment | Strategy | Investors | Owners
Designers | Builders | Operators | Suppliers
Safety | Quality | Compliance



Generations of Nuclear Energy



Auto racing is not new, we've been doing it for over 100 years



Question – do these machines evoke thoughts & feelings?

Fear, Concern, Death, Injury, Safety, Cost, Continual Improvement?

Designing / building / operating / maintaining power plants is not new, we've been doing it for over 100 years



Owners & Investors must unconditionally endorse all aspects with focus on elements of success & accountabilities

If you don't understand what you are getting into before the start – it could kill you

If you don't do your homework you won't win



The Pile "Up"



Team Work | Commitment | Effective Management Systems
Safety | Quality | Compliance
= Prevention

Leverage Lessons Learned 1984

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



564 Pages

Reprinted March 1987

“Early training to Appendix B of 10CFR50 was through on the job training with experienced personnel. **In 1975, training in Appendix B consisted of self-reading.** In 1976, one hour of a fragmented course whose schedule was diverted by the class, was allocated to Appendix B. **A longer formalized course on Appendix B was not developed until 1983. During the study, it was stated there is a great need for more training in quality assurance, standards and Appendix 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 and qualifications of inspectors.”

B.66

Want to Win?

Nothings Changed - Homework First - Start at The Beginning

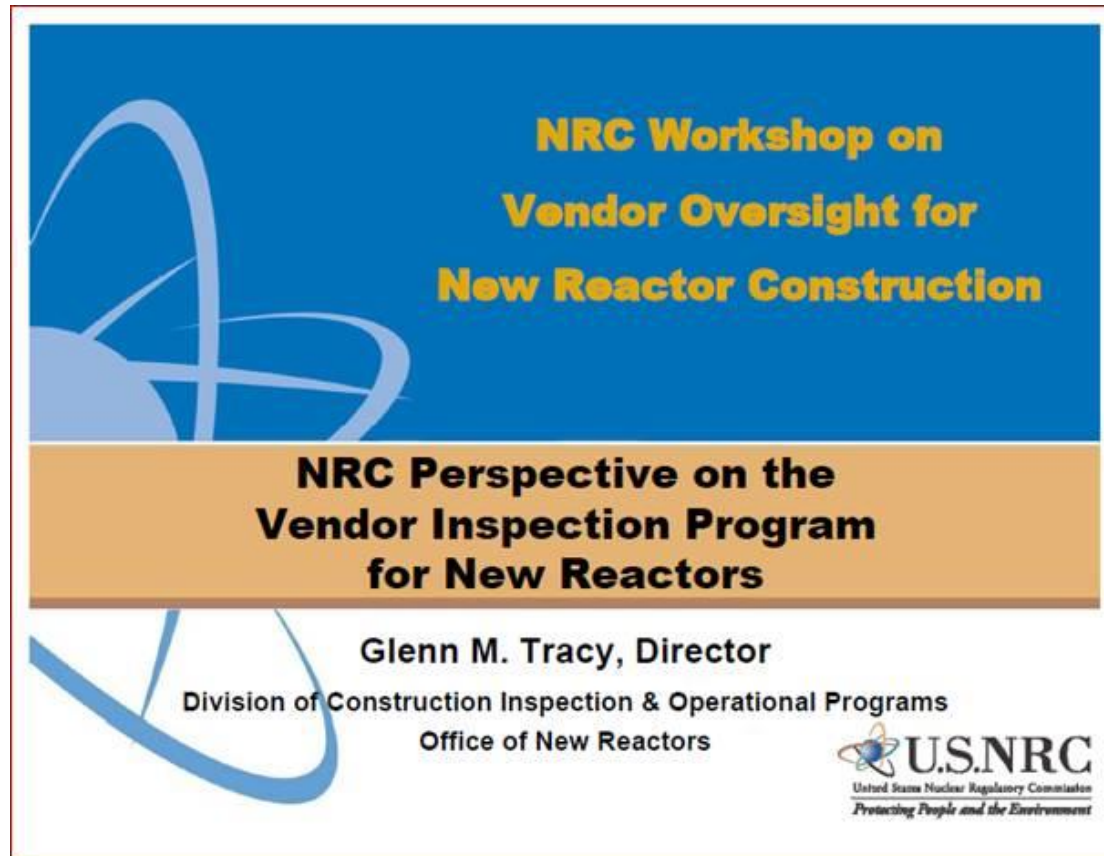
“Circa 2000 The U.S. Nuclear Power Renaissance”

2008 NRC HQ Held 1st Supplier Workshop

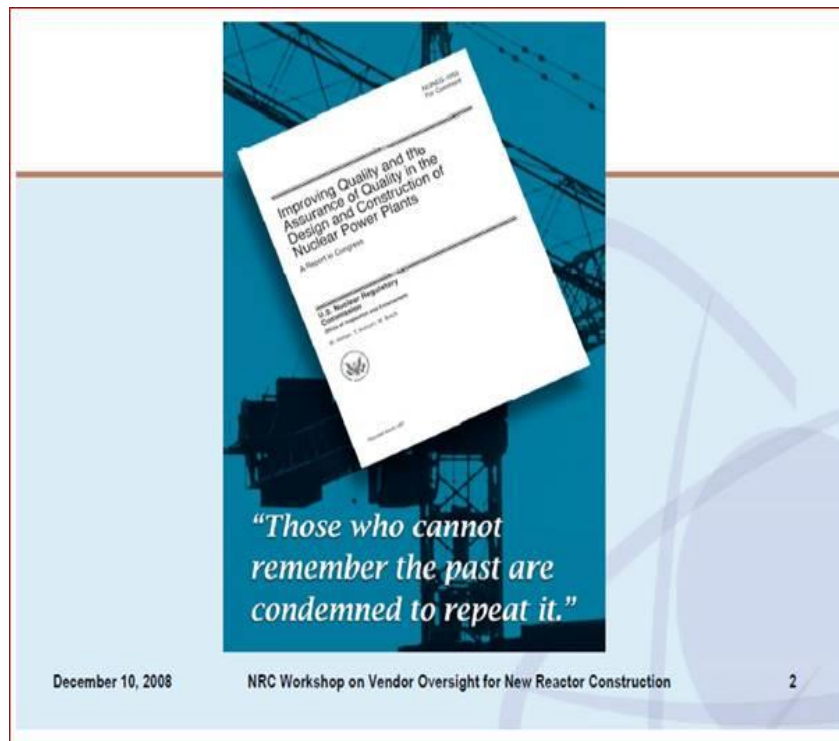
The U.S. NRC Told the Supply Chain “Do Your Homework”

Did The Supply Chain Listen & Learn from the ‘60s, ‘70s, ‘80s?

First Day – First Presentation
Did Anyone ‘Special Note’ this Report?



First Day – First Presentation Did Anyone ‘Special Note’ this Report?



NRC <https://www.nrc.gov/docs/ML0930/ML093070143.pdf>

NRC Site <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1055/>

PDF-1055 <https://www.nrc.gov/docs/ML0630/ML063000293.pdf>

Homework Wins - Understand the Past

The United States of America General Quality | Safety Timeline



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
- 1986 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
- 2001 Prince William Sound (Alaska, U.S.)
- 2002 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)

1940

1960

1970

1985

2001

2017

U.S. Quality Leaders Emerge

- Dr. Walter A. Shewhart
- Dr. W. Edwards Deming
- Dr. Armand V. Feigenbaum
- Dr. Joseph M. Juran
- Philip B. Crosby

Conformance to Requirements

(Concept Emerges 1979)

"Quality is Free"

Philip B. Crosby

QM & Quality Tools

- SixSigma, QFD, FEMA,
- PDCA, C&E Diagraming, Process Mapping, Software, Self-Assessments
- ISO QMS Certifications Reach 450 Million 2000

"The Next Industrial & Quality Revolution"

Considerable Emphasis on Quality | Safety Begins 1970s

"Cost of Poor Quality" U.S. Military
Concept Begins Military Supplier Chain

1971
OSHA Created

Integrated Management Systems

- ISM, QMS, EMS, RM, SCM, others
- ISO QMS Certifications Reach 1.5 Million (2011), 178 Countries
- Post 911 Safety / Security
- Requirements Matrix (Advanced)
- Process Hazards Mgt
- Enterprise Software (Advanced)
- Cyber Security
- Supply Chain Mgt (Advanced)

911 - 2001

BP Deepwater Horizon
Oil Spill - 2010

Self - Inspection

Productivity
Studies (SPC)

Quality Control

Quality Control
In-Process Inspection

Mass Production

Quality Control Evolves as
Basis for Quality Assurance

Quality Assurance
w/ Quality Control

Complex Engineered
Products / Systems / Software

Three Mile Island
Nuclear Power Plant
Accident - 1979

Quality Management

Quality Management Systems (QMS)

Pre - 1900 SI

1920s

1930s QC

1940s QC IP Inspection

1960s QA

1970s

1980s QM

1990s

2000s ISM

2017

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



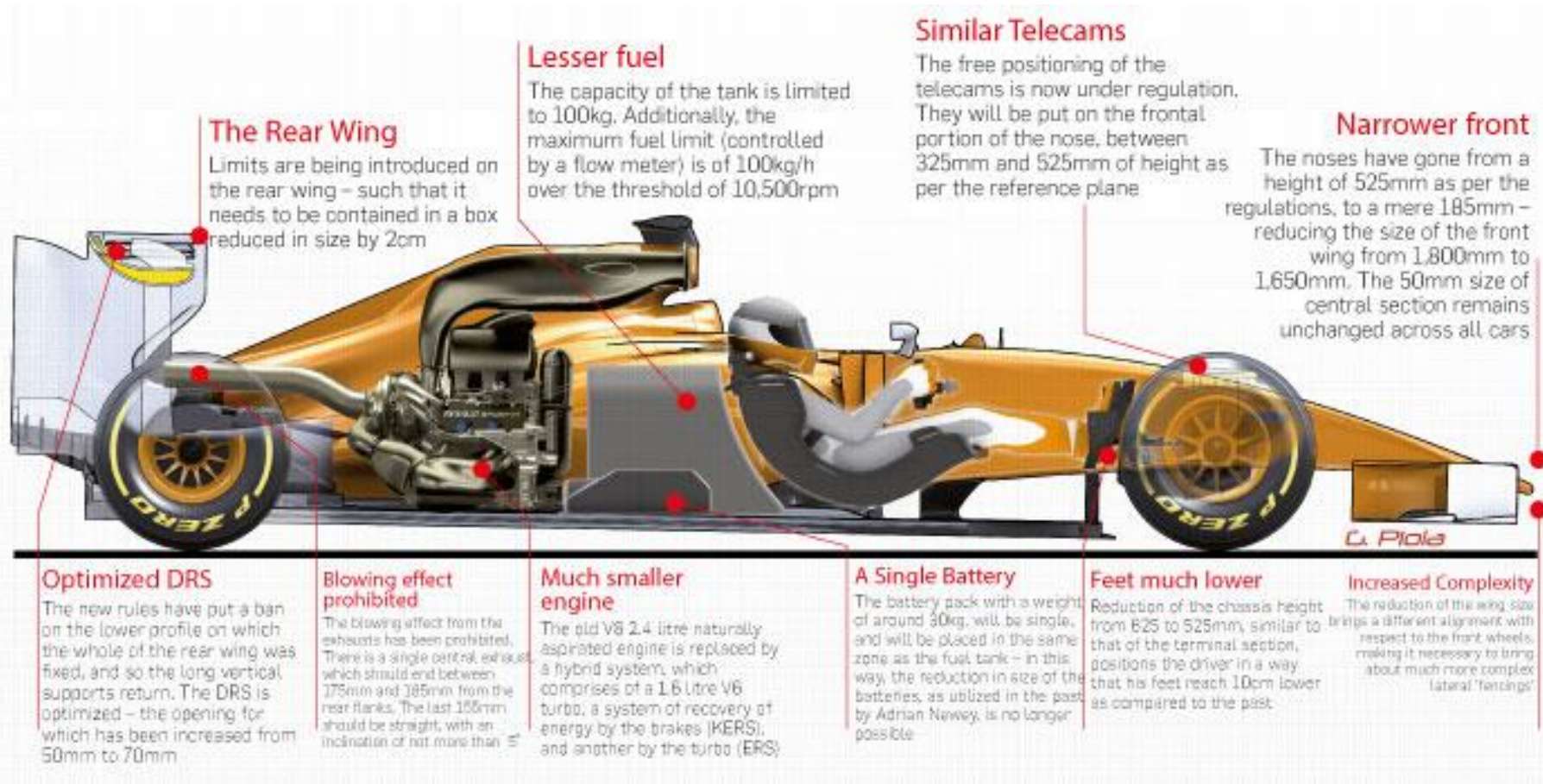
Elements to Win

<div> <div>↓ Nuclear Energy</div> <div>↓ Auto Race</div> </div>			
Organization	Team Work	Inspection	Inspect Everything All the Time
Program	Strategy Tactics Qualify Schedule	Test	Test Criteria Use & Verification
Design	Design Performance	Measuring Test Equip.	Tools / Gages Accuracy & Maintenance
Procurement	Qualified Certified Supply Sources	Handling & Storage	Everything for Preservation
Procedures	Rules Regulations Team Methods	Inspect., Test, Oper St.	ID & Control Performance Results
Documents	Information Communications	Nonconforming Items	ID & Control Errors
Pur'd Mtl, Equip, Serv	Inspect, Test, Verify, Ensure	Corrective Action	Repair, Rework, Upgrade
ID Mtls, Parts, Comp.	Trace / Color-code / Label	Records	All Performance Data
Special Processes	Monitor & Measure Perf.	Audits	Team Inputs, Mtgs., Reviews, Strategy

Nuclear Energy Needs the Intrigued | Inspired Next Generations
& Embrace 18 Element Management System – it's the law 10CFR50 Appendix B

Auto Racing Needs the Intrigued | Inspired Next Generations
& Embrace 18 Element Management System

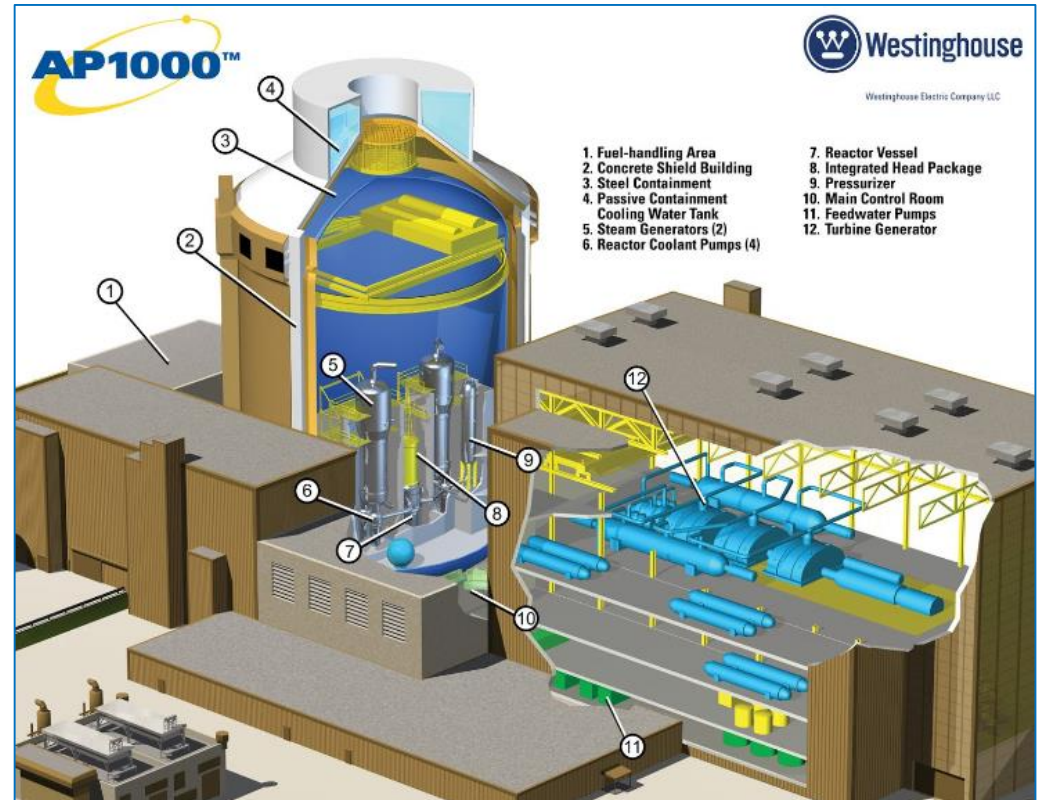
Team Work – Strategy – Design – Qualify – Regulations – Information – Ensure – Trace – Monitor
Inspection – Test – Tools – Handle – Status – Errors – Corrections – Data – Assess

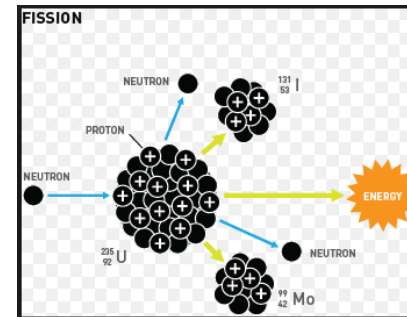
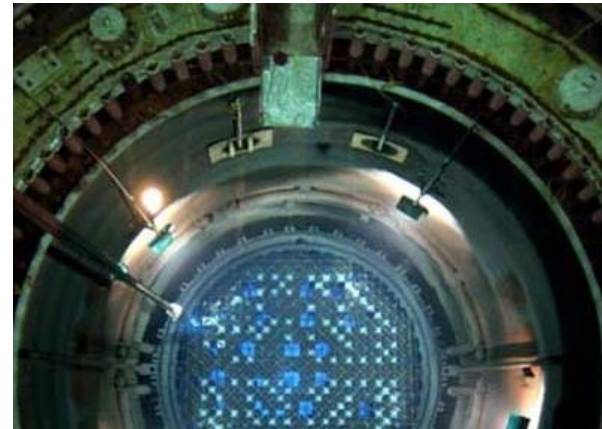


25 reasons why Michael Schumacher is the greatest F1 driver of all time

Design Wins

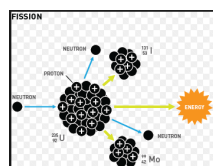
NUSCALE
POWER™





Because nuclear fission is a very efficient source of energy, nuclear reactors require very little fuel. A single 20-gram uranium fuel pellet can produce the same amount of energy as 400 kilograms of coal, 410 litres of oil, or 350 cubic metres of natural gas.

THE POWER OF URANIUM



20 grams of
URANIUM

=



400 kilograms of
COAL

OR



410 litres of
OIL

OR

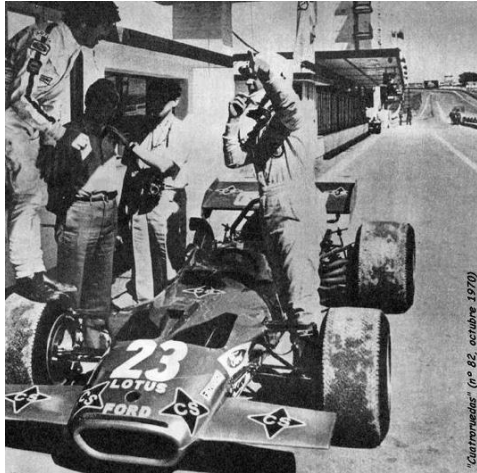


350 cubic metres of
NATURAL GAS



Push the Envelope - Always

Control the Race to Win



Then



Now





**Three Mile Island
Pennsylvania, USA
1979**

Operator & Design Errors

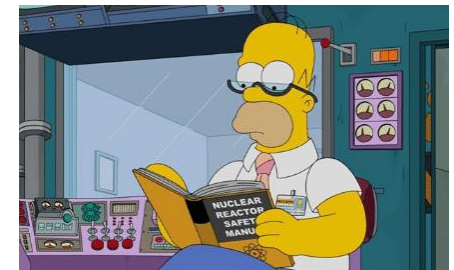
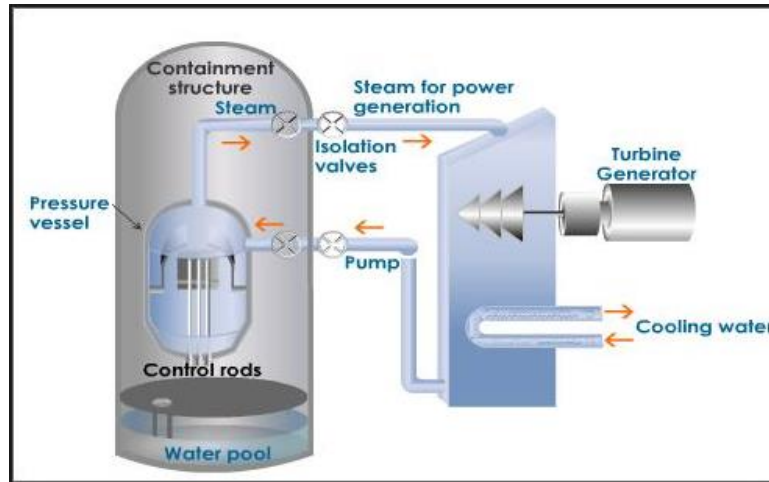
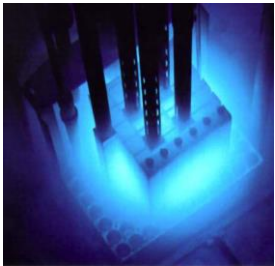
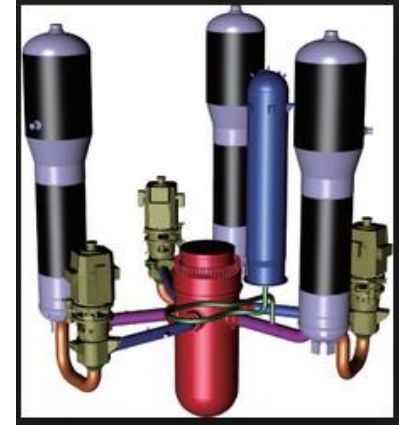
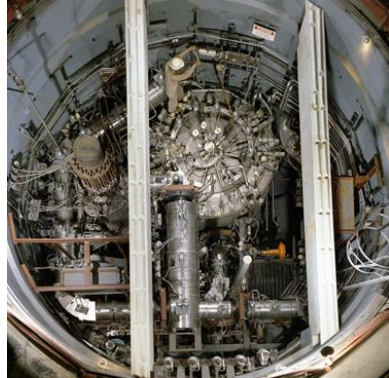


**Chernobyl
Russia
1986**

**Fukushima Daiichi
Japan
2011**



Effective “Strategy & Systems” Win



The Win - Glory | Wealth | Excitement | Smart

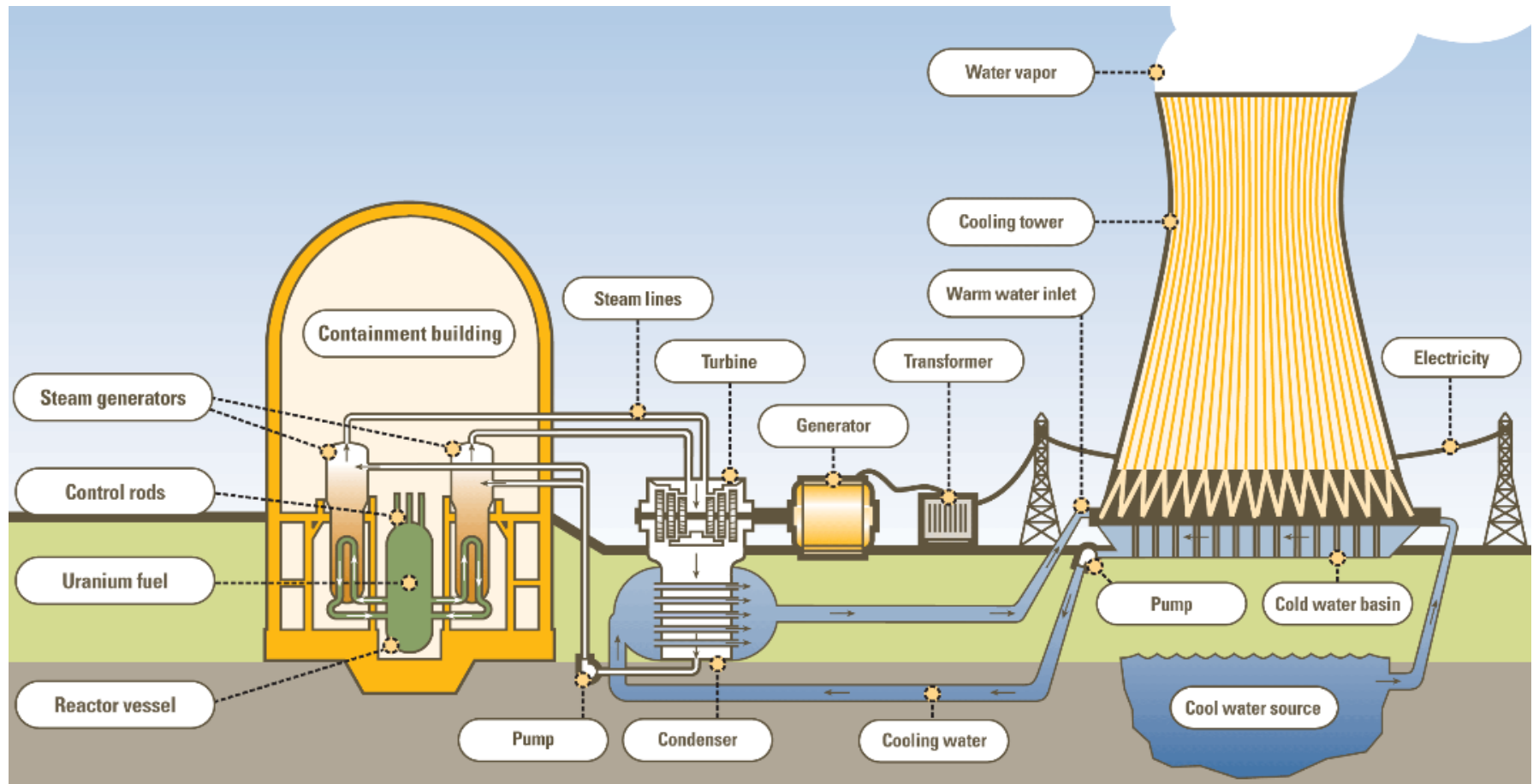
Team Work | Commitment | Effective Management Systems
Safety | Quality | Compliance
= The Win



Simply Smart

Safety | Quality | Compliance = The Win





***“Focus & Leverage Lessons Learned
NRC NUREG-1055”***

Focus on Design



 **NUSCALE
POWER™**



Focus on Safety

Focus on Quality



Global Quality Management Advisors



California
Georgia
Nevada

North Carolina
Oregon
Tennessee

Texas
Utah
Virginia

Washington
Washington, DC

Is Your Team Focused on its Goals & Objectives for Performance Excellence?

If not, evaluate your management system – upgrade & improve.

Is Your Management System Focused on Quality?



https://gqmadvisors.com/wp-content/uploads/2016/08/GQM_updatedAudio.mp4?_t=1