



Łańcuch dostaw i procedury zapewnienia jakości w realizacji elektrowni jądrowej budowanej w oparciu o technologię amerykańską.

Supply chain and quality assurance procedures in execution of nuclear power plant based on American technology.

Ziemowit Iwański
Executive Foreign Markets
Energoprojekt Katowice S.A.





- **US Nuclear Quality Background**
- **Nuclear Safety Related Criteria**
- **Supplier Qualification Process**



US Nuclear Quality Background





- Started in '60 with development of commercial nuclear plants
- US Nuclear Regulatory Commission (USNRC) regulates civilian nuclear work including new plant construction and provides regulatory oversight of the nuclear industry
- July 1970 -US Standards (10CFR50 Appendix B) defines 18 basic criteria
- Reinvigorated from industry lessons learned (3-Mile Island and Human Performance program)



10CFR50; Appendix B – 18 Criteria



1. Organization – Structure & Functional Responsibility
2. Quality Assurance Program
3. Design Control
4. Procurement Document Control
5. Instructions, Procedures, & Drawings
6. Document Control
7. Control of Purchased Materials & Services
8. Identification & Control of Materials, Parts, and Components
9. Control of Special Processes
10. Inspection
11. Test Control
12. Control of Measuring and Test Equipment
13. Handling, Storage, and Shipping
14. Inspection, Test, and Operating Status
15. Non Conforming Materials, Parts, or Components
16. Corrective Action
17. Quality Assurance Records
18. Audits



Company Quality Overview

- Driving Culture to all levels in the organization
- Incorporates Industry Lessons Learned
- Human Performance Tools
- 6-sigma statistical improvement and lean principles ... lasting changes

Driving to Quality at the source

Continuous improvement

- Independent quality inspection and complete records
- Independent audits to all the organization functions
- Control of procurement product ...Approved Supplier List controls

Solid product/process oversight

Regulated Environment

- 10CFR50 App B, Part 21
- ASME (10CFR 50.55a)
- ASME NQA-1
- ASME NCA-3800, 3900, 4000
- ISO 17025

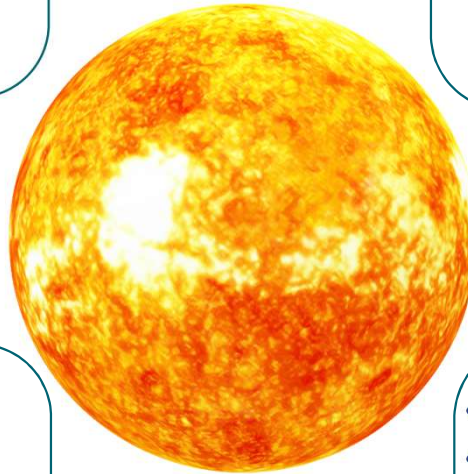
Includes in-house and outsourced activities

Training & people

- Initial training commensurate with position
- Qualifications for Quality Roles (Inspectors, NDE, Lead Auditors)
- Retrain and maintain production staff
- Procedure Reliance vs. culture of tribal knowledge

Dedicated Quality Resources

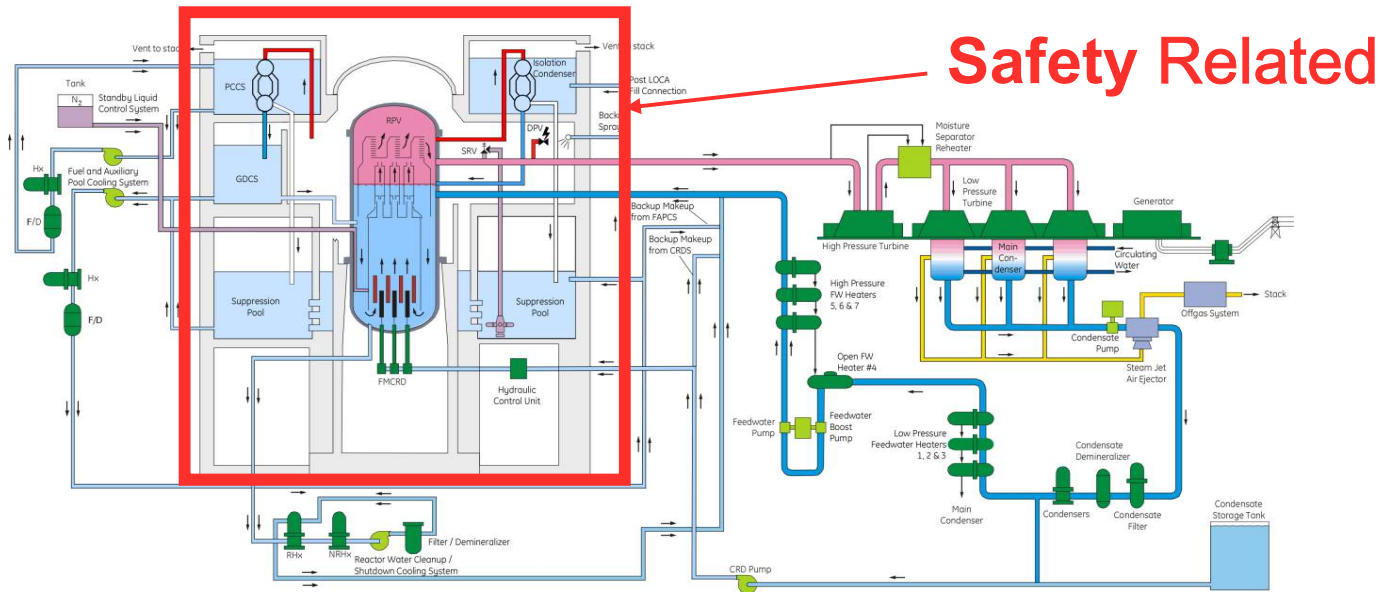
Inspection Auditing





Nuclear Safety Related Criteria





- Safety related (*reactor vessel, primary piping ,*) ~60%
- Important to safety (*piping, steel, concrete, instruments, valves, pumps heat exchangers*) ~10%
- Non-safety related (*turbine, condenser, cooling water, lighting*) ~30%



- Structures, systems and components, that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of public.
“BASIC COMPONENT”
- Includes all activities affecting the safety-related functions ... design, purchasing, fabrication, operations ...



- Procurement of a Safety related component:
 - From ASME-NQA supplier
 - Commercial Grade Dedication
- Non-Safety related
 - Supplemented Quality Requirements for Important to Safety items
 - Commercial Supplier

- ❖ Nuclear Island: N-Stamp Required
- ❖ Turbine Island: ASME Code Requirements
- ❖ Yard: Industry Standard Practices

Qualification

- Ability to meet product requirements
- Production rigor
- Control of key processes
- Supplier capacity

Regulatory Flowdown

- Audits/Right of Access ... in process inspection
- QA requirements ... certificate of conformance, documentation requirements, notification of product defects in accordance with regulations.
- Customer approval of non-conformance dispositions

Performance

- Ability to monitor supplier on time delivery & defects
- Supplier side to side comparison
- Improvement plan if necessary



- Meeting quality & schedule requirements. Proven delivery performance
- Strong quality program in accordance with industry norms
- Technical expertise and problem solving
- Supplier adequate capacity & production rigor
- Requirements driven by component criticality & safety function

Rigorous process to confirm function and quality



- Right to access, on-site audit on QA program, periodic surveillances
- Witness and Hold points
- Reporting latent defects per current regulations
- Responsible for sub-tier supplier compliance
- Full cycle material/documentation conformance
- Segregation of non-conformance product
- Handling & storage product

Always looking to improve ... controlling with quality systems



- Monitoring
 - on-time delivery
 - non-conformances/deviations
- Periodic reviews with supplier
- Regular communication during production including witness and hold points
- Performance improvement plan with suppliers as needed

Develop strategies to mitigate risk and realize opportunities



Where do you go from here?

- Indicate your interest in becoming a qualified vendor to utilities and design companies
- Monitor the Development of the country Nuclear regulations to ensure compliance (*will the regulations be similar to the US model ?*)
- Check the US industry groups ... they are a great way to interface with other vendors and to improve your QA





PYTANIA?





DZIĘKUJĘ ZA UWAGĘ

www.epk.com.pl

adres e-mail:

iwanski.ziemowit@epk.com.pl

