



Hungarian Atomic Energy Authority

Status Report on Environmental Qualification of Equipment for NPP in Hungary

Miklós Csuvár

Hungarian Atomic Energy Authority

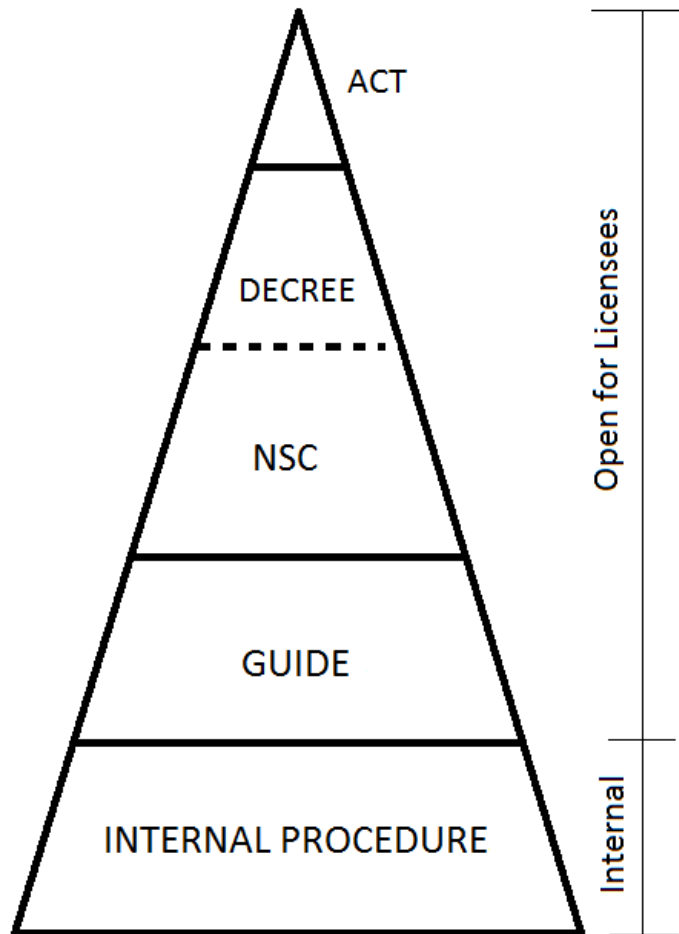


Hungarian Atomic Energy Authority

CONTENTS

- Legal framework
- EQ program related activities at Regulatory Body
- Supplier activity – An example
- Status of Equipment Qualification

LEGAL FRAMEWORK (1/7)



- Act CXVI of 1996 on Atomic Energy
- Governmental Degree 118/2011 (Nuclear Facilities)
- Annexes of Governmental Decree (118/2011)
- It has 10 + 1 chapters
- Recommendations for licencee
- Obligatory for HAEA



Hungarian Atomic Energy Authority

LEGAL FRAMEWORK (2/7) – Act on Atomic Energy

- 10. § (2) The licensee, within its scope of activity, shall provide the technical, technological, material and human conditions necessary for the safe use of atomic energy, the maintenance and development of safety, and shall continuously monitor the radiation conditions in harmony with the latest justified scientific results and the international expectations and experience.



Hungarian Atomic Energy Authority

LEGAL FRAMEWORK (3/7) – GOVERNMENT DECREE

On on the nuclear safety requirements of nuclear facilities and on related regulatory activities

- 6. § (1): Design in accordance with the safety goals.
- 9. § (2): Factors affecting safety assessed in design phase.
- 10. § (1): Determining the characteristics of SSC for proper management of AOO and DBA.
- 34. § (1): PSAR-design basis compliance, each 10 years
- 34. § (3): Licensee develop and execute program to eliminate/mitigate revealed risks.
- 34. § (4): PSAR submittal: comparison with national requirements and international good practice.



Hungarian Atomic Energy Authority

LEGAL FRAMEWORK (4/7) – NSC Vol1: Nuclear safety authority procedures of nuclear facilities

- 1.2.3.0280.: Design principles to demonstrate in Prel. Safety Asse. Report – EQ of SSC
- 1.6.2.1900.: To inspect by authority in operational phase - EQ
- 1.7.3.0500.: EQ to demonstrate in PSAR.



Hungarian Atomic Energy Authority

LEGAL FRAMEWORK (5/7) – NSC Vol3: Design

- 3.3.1.1700. Safety Class – equipment qualification requirements
- 3.3.2.0600. SSC design: qualified materials to use
- 3.3.2.2400. Environment cond's to determine for DBA
- 3.3.2.2500. Capability to function justified with qualification methods
- 3.3.2.2700. Individual or type qualifications
- 3.3.2.2900. Cond's&meth. for EQ maintenance to determine in design phase
- 3.3.2.3200, 3.3.2.3300: To operate in DEC -> Qualification
- 3.4.7.0200. Ventillation sys. to support EQ maintenance



Hungarian Atomic Energy Authority

LEGAL FRAMEWORK (6/7) – NSC Vol4: Operation

- 4.6.0.0100. Function maintenance: safety analysis, equipment qualification, ageing management, maintenance
- 4.6.2.0200. Above ones depend on Licensee. BUT EQ, if harsh env.
- 4.6.3.0100. EQ to maintain
- 4.6.3.0200. Methods of use determined in design, BUT monitoring is necessary
- 4.6.3.0400. Non-complete EQ -> Consequences assessed -> Priorities for the programme to complete
- 4.6.3.0500. Residual lifetime -> Testing, replacement, reconstruction programmes
- 4.6.3.0600. EQ method to complete earlier shortcomings
- 4.6.3.0700. Parameter margins exceeded => EQ invalid
- 4.6.3.0800. Already operated in harsh env. => Replacement
- 4.6.3.0900. EQ unavailable/invalid/EQ lifetime ends => Replacement



Hungarian Atomic Energy Authority

LEGAL FRAMEWORK (7/7) - GUIDELINES

- Old reactors
 - Environmental qualification of equipment during the design of nuclear power plants
 - Environmental qualification and maintenance of the qualified state of equipment in operating nuclear power plant
- New reactors
 - The method and process of environmental qualification of systems, structures and components important to nuclear safety during design of new nuclear power plants



Hungarian Atomic Energy Authority

HAEA ACTIVITY

1. Supervision of suppliers and their activity: audits
2. Management of submitted licence requests
3. Factory Acceptance Tests
4. Periodic Safety Assessment Report
5. Other: inspections – ad-hoc, comprehensive



Hungarian Atomic Energy Authority

SUPPLIER ACTIVITY – AN EXAMPLE (1/6)

VISOLA Co., Ltd.

- Supplier since 1992
- Hermetic cable penetrations, cables
 - Manufacturing, repair
 - Qualification
- Qualification coordination
 - Thermal ageing: VEIKI VNL Co., Ltd.
 - Radiation ageing: Institute of Isotopes Co., Ltd.
 - Seismic testing: Fac. of Civil Engineering (Budapest Univ. Of Techn and Economics)
 - Tűzvizsgálat: ÉMI Co., Ltd.

SUPPLIER ACTIVITY – AN EXAMPLE (2/6)



SUPPLIER ACTIVITY – AN EXAMPLE (3/6)



SUPPLIER ACTIVITY – AN EXAMPLE (4/6)



SUPPLIER ACTIVITY – AN EXAMPLE (5/6)



SUPPLIER ACTIVITY – AN EXAMPLE (6/6)





Hungarian Atomic Energy Authority

EQ STATUS (1/2) – LIFETIME EXTENSION 2012-2017

- Unit 1: Shortcomings of documentation -> Correction + Satisfactory EQ, EQ support and maintenance programme -> Lifetime extension licence
- Unit 2: No shortcomings -> Satisfactory EQ; EQ support and maintenance programme -> Lifetime extension licence
- Unit 3: 3. blokk: Requalification for some terminal switches -> Satisfactory EQ, EQ support and maintenance programme -> Lifetime extension licence
- Unit 4: Some I&C SSC EQ < 20 ys => Action plan: Requalification/replacement -> Lifetime extension licence



Hungarian Atomic Energy Authority

EQ STATUS (2/2) – PERIODIC SAFETY ASSESSMENT 2017

- 3-2: I&C equipment requalification or replacement (12 items)
- 3-5: EQ-ageing management database review <- Taking into account the Safety Class of terminal equipments
- 3-6, 3-7: PGKK russian I&C hermetic penetration: EQ program revision/penetration modification -> Covering whole PSAR period
- 3-12: Seismic qualification database: revision, daily updating
- 3-13, 3-14: EMC aspects in training, design
- 3-15: EMC related review of modification according to IEC 62003



Hungarian Atomic Energy Authority

Thank you for your attention!



Hungarian Atomic Energy Authority

CONTACTS

Miklós Csuvár (Mr.) (IPA: mikloːʃ ʧʊvaːr)

Hungarian Atomic Energy Authority

Group of Electric and I&C Equipment

Email : csuvar@haea.gov.hu

Mail: PO. Box 676., Budapest, Hungary, H-1539

Tel.: +3614364806