Management of EQ programs a Mochovce NPP, Unit 3 and 4, in the Slovak Republic

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1. Introduction

• Mochovce NPP consisting of four pressurized water reactors of Russian design type VVER 440/213 (unit output 440 MWe).

• Owner of the plant is Slovenské elektrárne, a nationally-owned company with a majority financial interest held by Enel, an Italian utility company.
2. Brief History

- Preparatory work was started on June 1981, and site construction for Mochovce 1 and Mochovce 2 started in November 1982.
- Construction of the remaining two units, Mochovce 3 and Mochovce 4, began in 1985 but work on all four units was halted in 1991 due to a lack of funds. In 1995 the Slovak government approved a plan to finish the first pair with additional Western safety technology. The first two units were commissioned in 1998 and 1999 respectively.
- Installed capacity of units 1 and 2 was up-rated by 7% in 2008.
- Construction of Units 3 and 4 restarted in November 2008 and is planned to be completed in 2012 and 2013.
4. Public Opinion & Electricity Needs

• Commissioning of the plant has sparking protests in Austria - a neighboring country strongly opposed to the use of nuclear energy in general.

• Completion of 2 units is highly demanded project because energy security of Slovak Republic (after decommissioning 2 units of EBO V1 NPP - 500 MWe permanent outage).
5. Nuclear Safety & EQ

- In 2006, State Regulatory Authority (ÚJD) introduced completely new nuclear legislation.
- New legal nuclear codex recognized and define the term Equipment Qualification.
- Anyhow, the term Equipment Qualification has been defined hard widely and freely applied interpretation causing headaches of suppliers managing directors with signed fixed price contracts.
- Through the methodology documents there is established process of equipment qualification explained as fight against common cause failure – principles of Defense in the depth approach, see IAEA SRS No. 3.
6. Methodology

• There was issued a set of 5 methodologies defining the scope and requirements for safety-related equipment documentation – graded approach.

• IEC 60780 has defined as a basis standards for Equipment Qualification.

• IEEE 323 - general qualification standard has been introduced as fully compatible with IEC 60780.

• Specific IEEE and other international recognized standards are recommended for individual types of equipment (cca 30 Equipment Classes)
6. Documentation Process

- **Qualification specification** defines the requirements on scope of qualification documentation for specific equipment in technological/process chains MO34.

- **Individual Qualification Programs** defines the roadmap how to achieved qualification requirements specified in Qualification Specification for equipment that

- **Qualification Summary Report** summarized and evaluated documentation of EQ programs.

- **Qualification Adequacy Protocols** collect the essential EQ data and defined qualification status = qualification life + conditions
### 7. Protocols Examples - QS

#### 1. Equipment / Component Identification

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#### 1.2 List of References

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#### 1.3 List of Related Technical Documentation

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8. Protocols Examples - QAP

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9. Lessons Learned

- The top managers of several companies misunderstanding the term of Equipment Qualification: after 1 year of preparation documents start to recognize distinction between Quality Assurance documents and EQ documentation.

- Overinflating of qualification requirements. (DESIGN VS ENVIRONMENTAL QUALIFICATION) The originally designed equipment according to industrial accepted standards are required to be qualified according to civil structure standard STN 332000-3 defining the special design features to equipment (see vibration resistance AH2 etc.) – the need to follow IEEE Std 627-2010!!
QUESTIONS ?!

A one of view to Mochovce NPP...

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