

12th International Workshop
on the application of FPGAs in NPPs

October 14-16, 2019
Budapest, Hungary

IAEA activities in the field of nuclear I&C engineering

Janos Eiler

Budapest, Hungary, 14-16 October 2019



IAEA

International Atomic Energy Agency

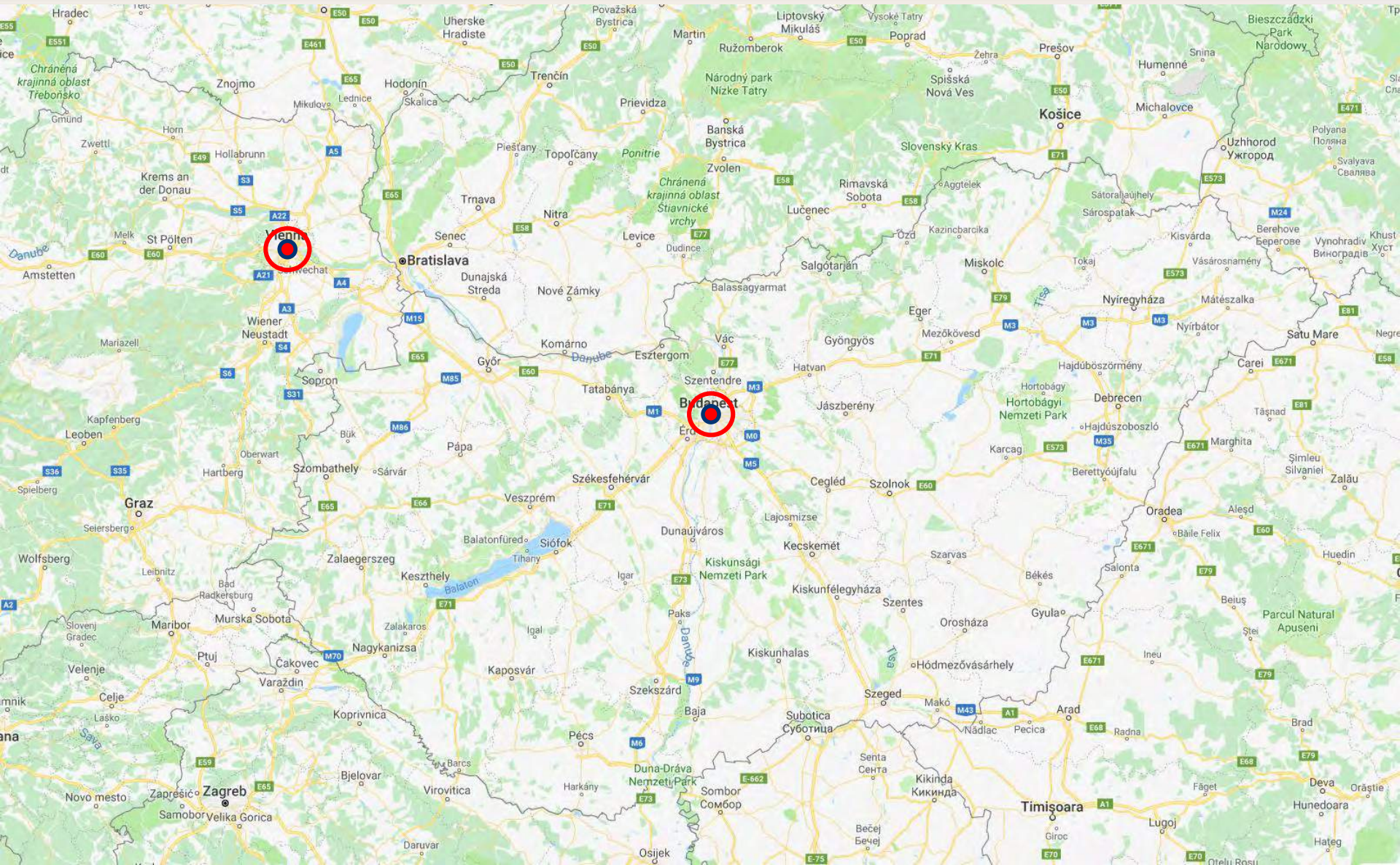
Paks I. The operating NPP in Hungary



Paks II. The prospective units in Hungary



IAEA (Vienna) – Budapest



IAEA at a glance

- Founded in 1957
- 171 member states
- New member in 2019
 - Saint Lucia
- 2453 staff
- Nobel Peace Prize – 2005



TWG group photo from 2019

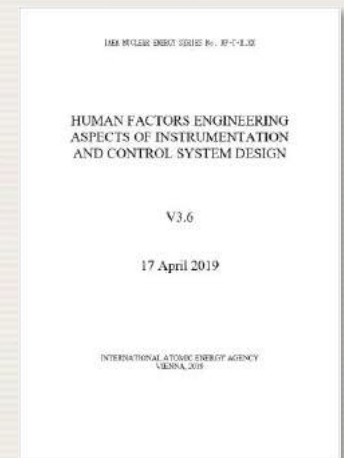
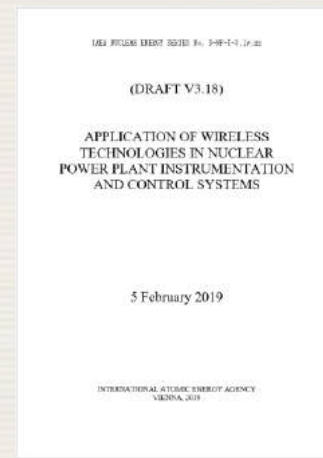
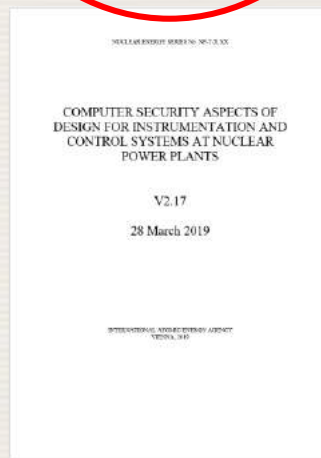
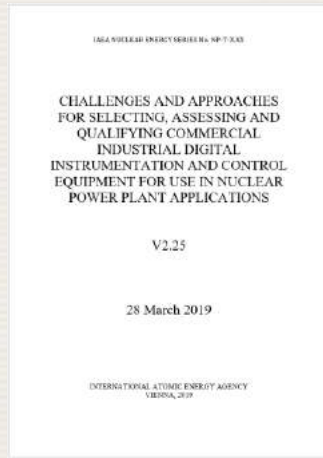
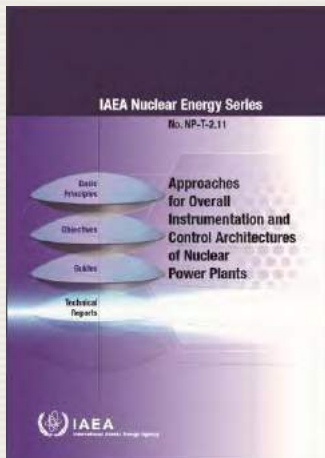
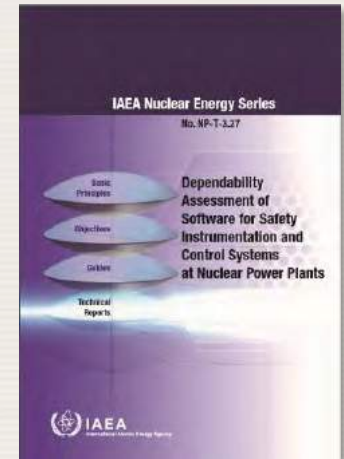
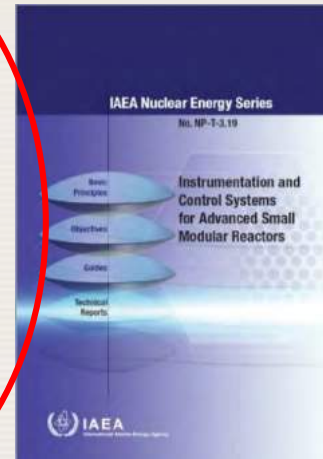
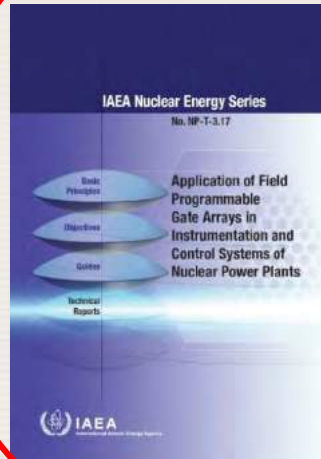
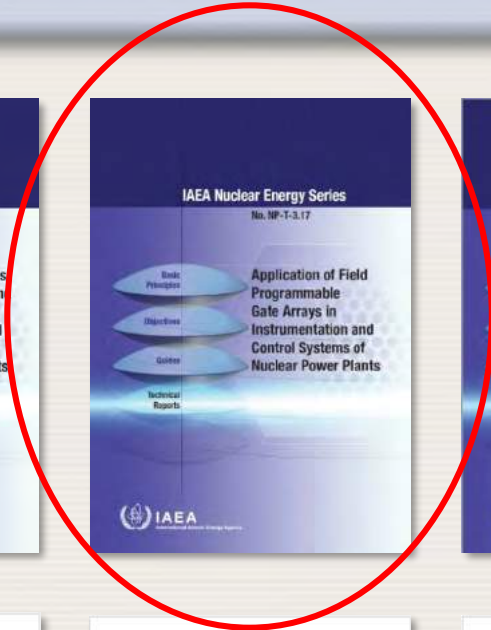
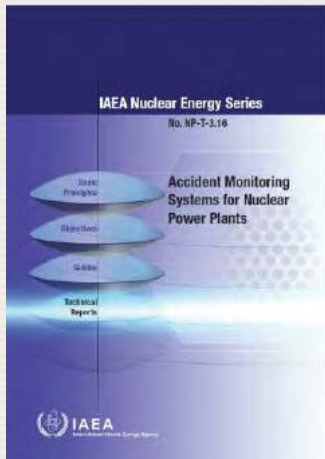
- I&C program for 2019 - 2023



Priority list of recommendations from the 2019 TWG meeting

- Under way
- I&C aging management, modernization and obsolescence
 - Adoption of systems engineering principles for NPP I&C
 - I&C support for plant performance optimization
 - Functional requirements specification for NPP I&C
 - Common-cause failure issues
-
- Intelligent technology application in NPPs
 - I&C configuration management
 - Certification/evaluation methods
 - I&C challenges for small/micro/advanced reactors
 - Decommissioning
 - Newcomer country support

Recent Nuclear Energy Series I&C publications



The IAEA report

- Nuclear Energy Series
 - NP-T-3.17
- Chairman: Joe Naser
- 79 pages
- 6 main chapters

IAEA Nuclear Energy Series

No. NP-T-3.17

Basic
Principles

Objectives

Guides

Technical
Reports

**Application of Field
Programmable
Gate Arrays in
Instrumentation and
Control Systems of
Nuclear Power Plants**

Structure

- Foreword
- 1. Introduction
- 2. Introduction to FPGA technology
- 3. Methods and tools for development and verification
- 4. Licensing
- 5. Replacement systems and new NPP designs
- 6. Summary
- References
- Annex I: Specific application examples and experience
- Annex II: Typical life cycle for an FPGA platform
- Glossary

List of participants at the 1st CS meeting

- Andrashov, A. Radiy, Ukraine
- Naser, J. EPRI, United States of America
- Arndt, S. US NRC, United States of America
- Seaman, S. Westinghouse, United States of America
- Eiler, J. International Atomic Energy Agency
- Glockler, O. SunPort SA, Switzerland
- Thuy, N. EDF R&D STEP, France
- Zeng, H. SNPAS, China



List of participants at the last CS meeting

- Eiler, J. International Atomic Energy Agency
- Russomanno, S. Global Nuclear Solutions Inc., Canada
- Thuy, N. EdF R&D STEP, France
- Gassino, J. IRSN, France
- Arndt, S. US NRC, United States of America
- Naser, J. EPRI, United States of America
- Glockler, O. SunPort SA, Switzerland





Links to access IAEA publications on I&C

- For Nuclear Energy I&C webpage
 - <https://www.iaea.org/topics/operation-and-maintenance/instrumentation-and-control-systems-for-nuclear-power-plants>
- For Nuclear Energy I&C publications
 - <https://www.iaea.org/topics/operation-and-maintenance/instrumentation-and-control-systems-for-nuclear-power-plants/iaea-publications>
- For all Nuclear Energy Series publications
 - <https://www.iaea.org/publications/search/type/nuclear-energy-series>
- IAEA publications in general
 - <https://www.iaea.org/publications>

Major events planned for 2019

- Technical meeting on “Critical **Challenges with Digital Instrumentation and Control Systems at Nuclear Power Plants**”, 8-11 October 2019, Budapest, Hungary
- Technical Meeting on “Management of **Direct Current Power Systems** and Application of Digital Devices in Safety Electrical Power Systems”, 2-6 December 2019, Vienna, Austria
- 12th International Workshop on the **Application of FPGAs** in NPPs, 14-16 October 2019, Budapest, Hungary

- World Nuclear Association’s Technical Workshop on **Current Status and Difficulties of I&C Modernization**, 29-31 October 2019, Erlangen, Germany
- Eastern European **Regional I&C Workshop**, 19-22 November 2019, Bucharest, Romania

Major events planned for 2020

- Technical meeting on “Adoption of **Systems Engineering Principles** for NPP I&C”, 1-4 September 2020, Helsinki, Finland
- Technical Meeting on “Managing the **Ageing and Obsolescence** of Nuclear I&C Systems and Components through **Modernization**”, 6-9 October 2020, Moscow, Russia
- Technical Meeting on “Safety Aspects of Using **Smart Digital Devices** in Nuclear Systems Important to the Safety of Nuclear Power Plants”, 17-21 February 2020, Vienna, Austria
- International Conference on **Nuclear Security**: Sustaining and Strengthening Efforts, 10–14 February 2020, Vienna, Austria

- **ISOFIC 2020**, International Symposium on Future I&C for Nuclear Power Plants, 24-26 November 2020, Okayama, Japan
- 13th International Workshop on the **Application of FPGAs**, TBD

Thank you for your attention!



I wish everyone a successful workshop!