Hungarian Atomic Energy Authority

Hungarian national experience in TSO supported safety assessment and review

Eszter Retfalvi

HAEA

Hungarian Atomic Energy Authority

New President of HAEA



Ms. Andrea Beatrix KÁDÁR

Appointed from:

1 January 2022

Hungarian Atomic Energy Authority

- HAEA, established on January 1, 1991
- Public budget organization performing tasks of public interest
- Supervise peaceful and safe application of atomic energy and guarantees it towards the public



Hungarian Atomic Energy Authority

The amendment of the Act on atomic energy and the related acts 2021

On 9th November, the Hungarian Parliament adopted the amendment of the Act on Atomic Energy. The HAEA will be a public institution with a special legal status.

-more independent financially and organizationally,

-rights to issue regulations

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INTRODUCTION

Role of the HAEA:

- Nuclear Safety
- Nuclear Security
- Emergency Preparedness
- Non-proliferation
- Radiation protection
- Legislation

Act CXVI of 1996 on Atomic Energy Section 4:

- The safe use of atomic energy shall be aided through the development of science and technology, harmonized organizational research, utilization of results of domestic and international research as well as through training of professionals.
- The central state budget shall cover the costs of technical support activities aimed at supporting the regulatory oversight of safe use of atomic energy.

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Hungarian nuclear programme NPP

Operating:

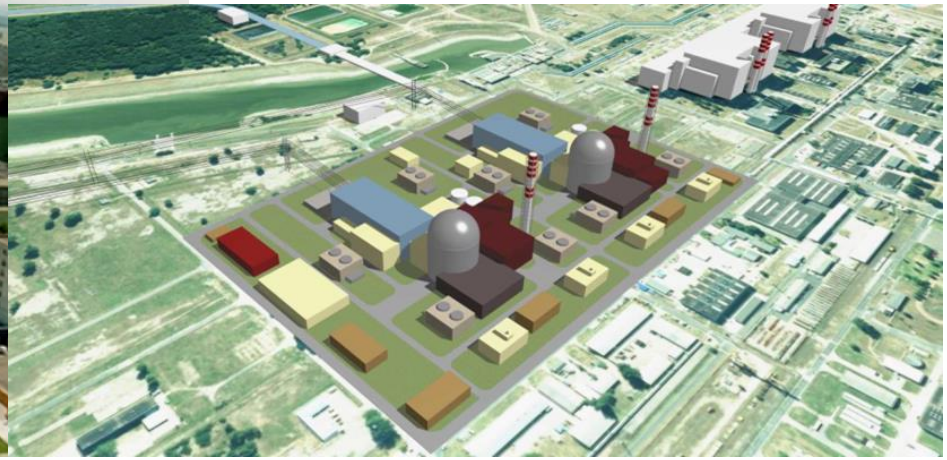
4 x VVER-440/213

1983-87

Licensing in progress

2 x VVER-1200 – AES 2006 (V-491)





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Hungarian nuclear programme Research Reactors

- Budapest Research Reactor
  - VVER SM tank type, 10 MWth
  - Operated by Center for Energy Research
  - Experiments and isotope production
- Budapest Training Reactor
  - Pool type, 100 kWth
  - Operated by Budapest University of Technology and Economics





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Hungarian nuclear programme

Interim spent fuel storage

Facility:

- dry storage for 50 years
- next to the NPP



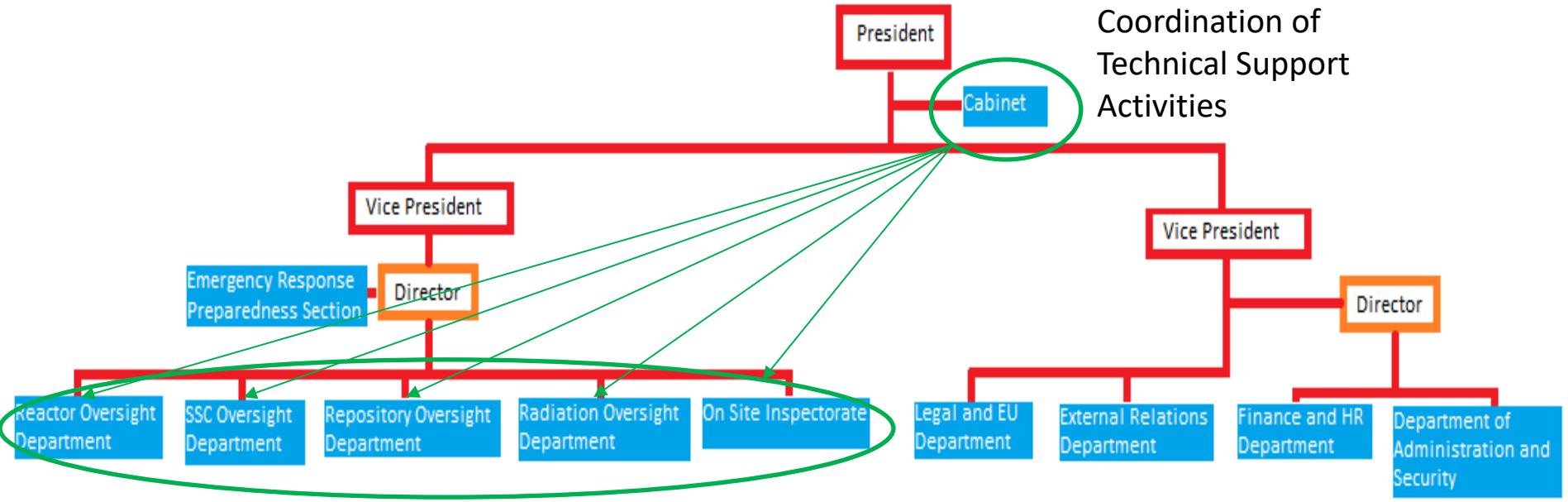
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Technical Support Activities at the HAEA - policy

- Defines principles:
  - Continuity
  - International cooperation
  - Effective utilization of results
- Defines short term priorities, outlines mid-to-long term objectives
  - Support the work of the HAEA (experts)
  - Nuclear new build
  - Maintenance and improvement of TSO expertise

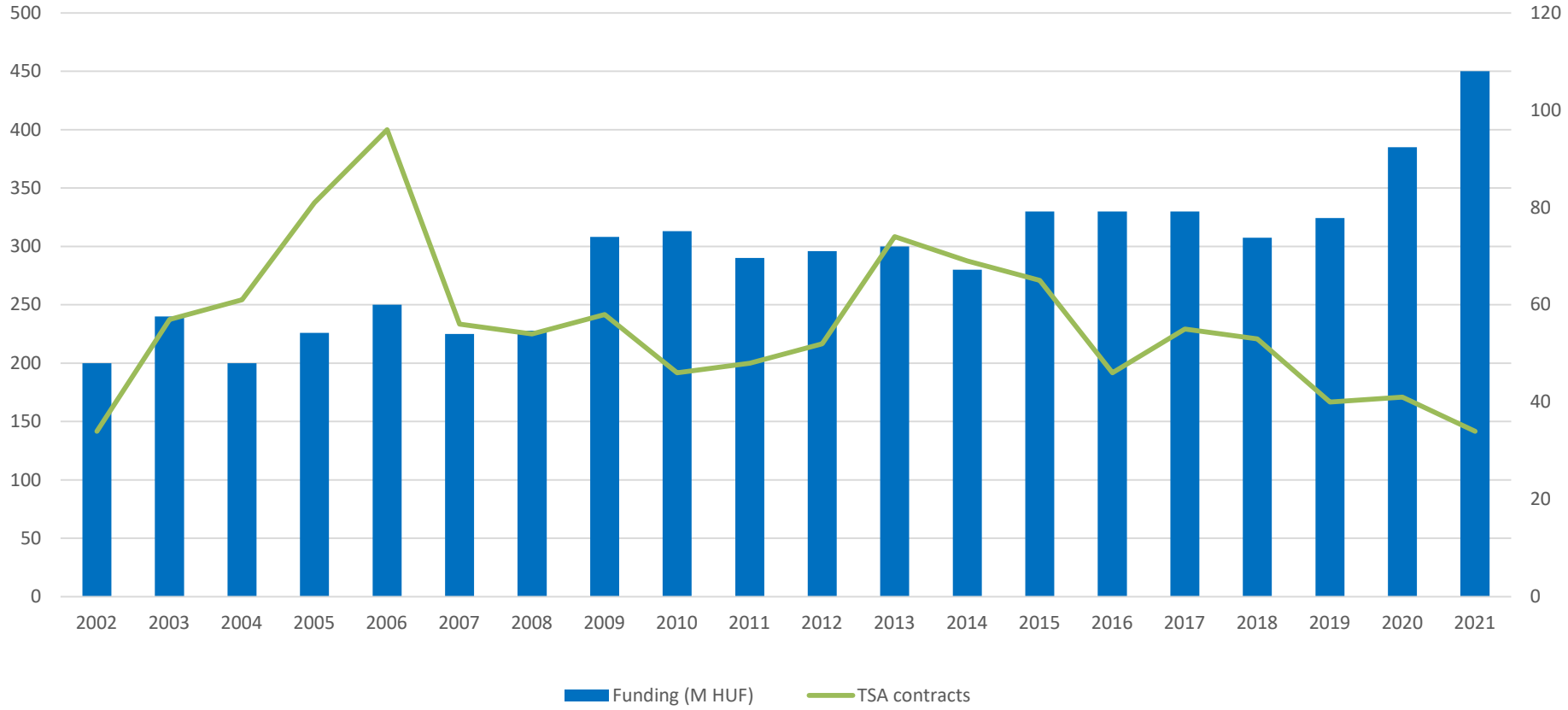
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Technical Support Activities at the HAEA - procedure



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Technical Support Activities at the HAEA - funding



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Technical Support Activities at the HAEA – regional, international cooperation

- TSO MoU (Centre for Energy Research, Budapest Technical University)
- Sustainable Nuclear Energy Technology Platform (SNETP) – Coordinated by CER
- European Joint Programme (EJP1) - WMOs, TSOs, Programme owner (Ministry of Innovation and Technology)
- Nuclear Industry Development Strategy – spearheaded by Ministry of Innovation and Technology

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The Hungarian Sustainable Nuclear Energy Technology Platform

- Launched in the summer of 2010

The main goal of the Platform is

- to coordinate the nuclear energy research and
- development activities in Hungary, taking into account:
  - the needs of the existing units of the Hungarian nuclear power plant,
  - the possible requirements of the new units to be built,
  - the development of the future significant Generation IV nuclear power plants as well as the problems of the fuel cycle.

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Examples of TSO involvement 1.

Examples of TSO involvement in the regulatory activities of the Radiation Oversight Department (dealing as well with physical protection issues):

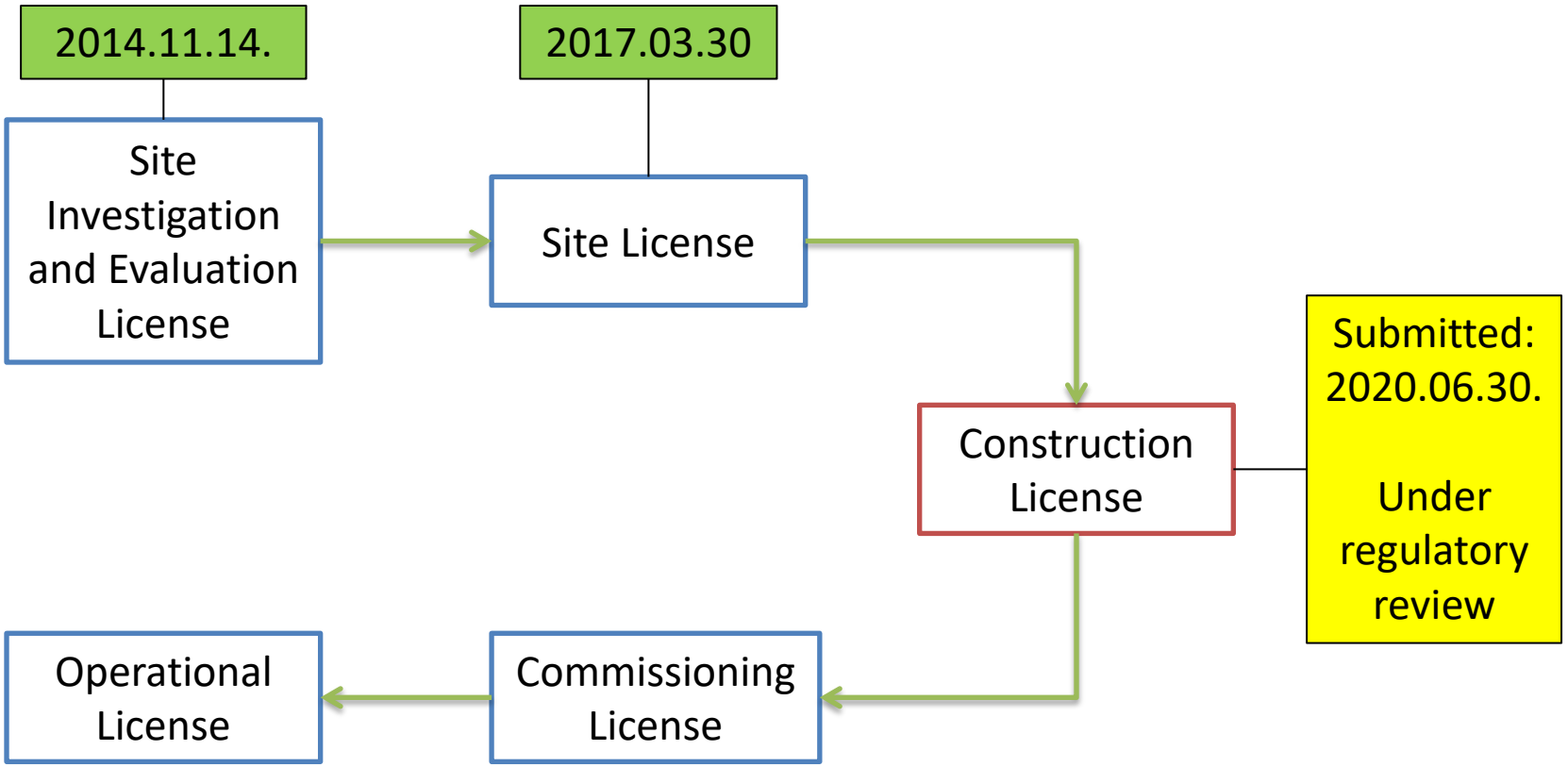
- Services to measure radiation (quantities of dose intensitiy and radioactive materials, including their qualitative characteristics)

Advice in regulatory assessment within licensing of the physical protection plan of the new build Paks II NPP

- Expert on explosive devices
- Expert from armed forces in relation of response forces protecting the plant

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Examples of TSO involvement 2.



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Content of the CLA

~45.500 pages

I. Justification Docs
1) PSAR
2) Technical information (if it is not part of the PSAR)
3) Independent Safety Analysis
4) Preliminary Nuclear Emergency Response Plan
5) Conceptual plan for long-term treatment of the spent fuel assemblies
6) Recommendation for definition of the safety zone
7) Document about the verification of ownership or trusteeship of properties located in the safety zone
8) Documents proving compliance with the requirements of the relevant regulatory decisions
9) Reports on Independent Expert Reviews
10) Preliminary schedule of the implementation activities and the preliminary version of the general organization plan

Preliminary Safety Analysis Report ~38.000 pages

~31.000 pages

II. Additional documents
1) Deterministic Safety Analyses
2) Probabilistic Safety Analyses
3) Impact analysis reports on the current nuclear facilities during the implementation and operation of the new nuclear power plant units
4) Strength and Fracture-mechanical calculations and calculations and analyses for lifetime, safety margins, leak before break, environmental qualification, reliability, aging and degradation

Topical/Technical Reports

+ 3D CAD model

~210.000 pages

III. Background documents
1) Basic Design
2) Design Specifications
3) V&V certifications, reports and user manual of softwers used for calculations and analyzes
4) Experimental and research reports for justification of suitability of different SSCs, in particular passive safety solutions
5) Other supplementary documents which were took into account, utilized and referenced during the preparation of submittal and background documents of ILA and they are not publicly available

Basic Design and Other Background docs

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Examples of TSO involvement 2.

Construction license application assessment for new NPP:

- HAEA staff: 104 person
- HAEA Scientific Comittee: 12 person
- External experts: 6 person
- Technical Support Organisations: Severel persons (11 organizations)
- IAEA TSR mission: 37 person

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Examples of TSO involvement 3.

Regulatory oversight of operating facilties:

- Modification licensing
- Inspections (limited)
- Assessment (PSA, events, ….)

General issues:

- Development of regulation and guides
- Software developments

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Transparency of application of the TSO's

-TSO seminars

-Annual reports

-Quality assured process

-Hungarian Knowledge Data Base



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Thank you for your attention!