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# Regulatory Challenges for the Security of Radioactive Material and Associated Facilities In Hungary

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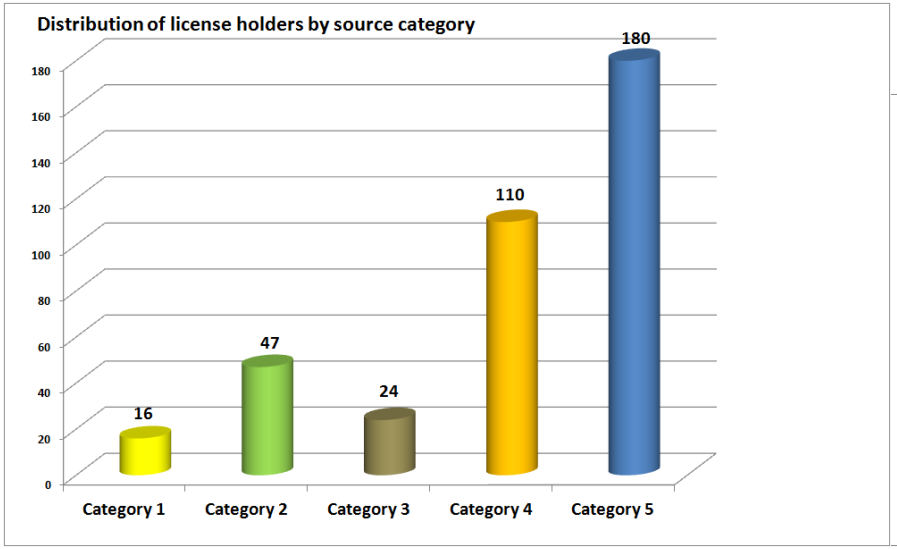
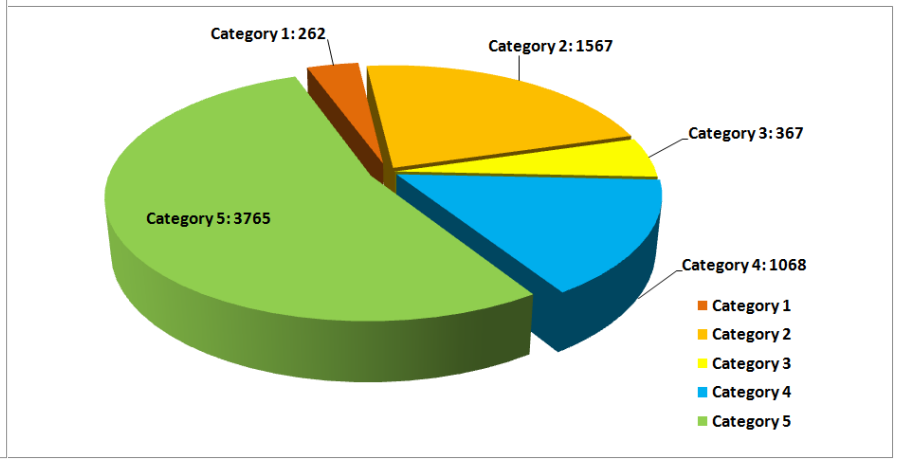
# Radioactive materials

- Central registry – all material above exemption level
- ~380 users and 7000 sources



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# Associated Facilities (examples)

| Category | Facility/Practice |
|---|---|
| 1 | •Sealed source producers - $^{60}$Co, $^{192}$Ir<br>•Irradiation facilities (blood, agricultural, medical)<br>•Teletherapy units in Hospitals<br>•Gamma knife |
| 2-3 | •Blood irradiation facilities<br>•Industrial gamma radiography<br>•High/medium level dose brachyterapy<br>•Industrial measurements |

Institute of Isotopes Co. Ltd.

Agroster Corporation

National Blood Service

Hospital of Uzsoki Utca

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# The Radioactive Waste Treatment and Disposal Facility (RWTDF)

- Operated by PURAM:
  Public Limited Company for Radioactive Waste Management
- Site at Püspökszilágy
- 10 to 20 $m^3$ low and intermediate level waste annually
- Several thousands of used radioactive sources
- From smaller radioactive waste producers (hospitals, laboratories and industrial companies)

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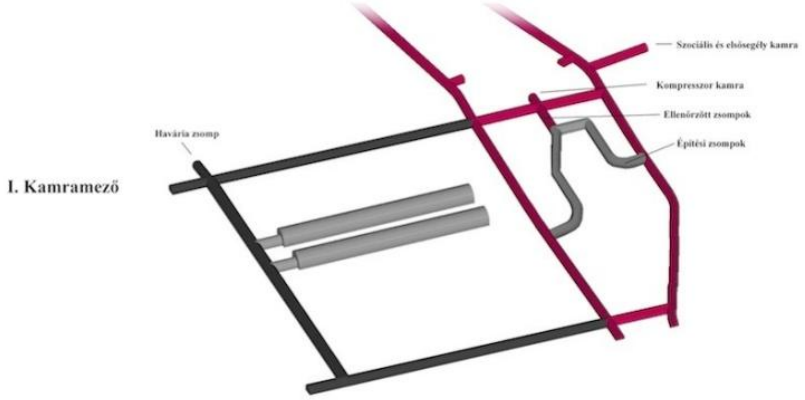
# The National Radioactive Waste Repository (NRWR)

Operated by PURAM
Site: Bátaapáti

Disposal of solid and liquid, LILW produced during the operation of the nuclear power plant

Operational licence - 2012



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# Equipment without radioactive sources

- X-ray machines
  - Medical
  - Veterinarian
  - Package check
- Linear accelerators

- ~ 5.000 licensees, ~ 7.000 devices

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# International Instruments (the frame)

- Ratified international conventions:
  - CPPNM
  - Amendment to CPPNM
  - Nuclear terrorism convention
  - Mode-specific transport agreements
- UN Council resolutions
- EU regulation (1493/93)
- EU directive (HASS) – new EU BSS
- IAEA BSS, Code of Conduct and Export-Import Guidance

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# National Instruments

- Act on Atomic Energy
- Act on Armed Security Guards
- Act on Regulatory Procedures
- Penal Code
- Government decree on physical protection
- Ministerial decree on Police tasks (as co-authority)
- Regulatory decisions

- Regulatory guidelines (www.haea.gov.hu)

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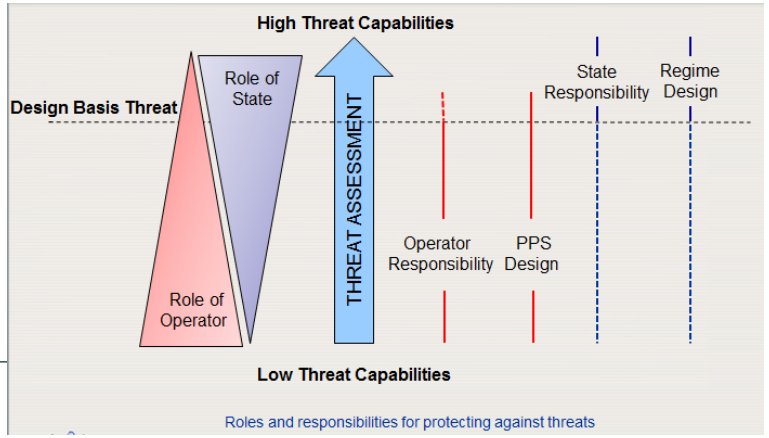
# Establishment and revision of the DBT

- HAEA assesses and determines the **national threat** and then establishes and revises the **DBT** in harmony with
  - *a)* Hungarian National Police Headquarters;
  - *b)* Military Security Office;
  - *c)* Constitution Protection Office; and
  - *d)* Counterterrorist Centre.

- **Prescriptive approach** for nuclear and other radioactive materials
  - Deterrence, detection, delay and response
- **Performance based approach** for
- nuclear facilities and storage/disposal facilities

- **Elevated level** of physical protection
- **State support beyond DBT**



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# Security levels

**A LEVEL -** PPS ensures the **prevention** of sabotage and unauthorized removal.

**B LEVEL -** PPS **reduces** the opportunity of sabotage and unauthorized removal.

**C LEVEL -** PPS **reduces** the opportunity of unauthorized removal.

**D LEVEL -** PPS **applies** prudent security measures.

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# Security Levels

| Material | | Security level |
|---|---|---|
| **Cat 4, 5** radioactive source | *(use, storage and transport )* | **D** |
| **Cat 4** radioactive waste | (*processing, storage and transport)* | |
| Non-categorized nuclear material | *(use, storage and transport )* | |
| **Cat 2, 3** radioactive source | *(use, storage and transport )* | **C** |
| **Cat 2, 3** radioactive waste | (*processing, storage and transport)* | |
| **Cat III** nuclear material | *(use, storage )* | |
| **Cat 1** radioactive source | *(use, storage and transport )* | **B** |
| **Cat 1** radioactive waste | *(processing, storage and transport)* | |
| **Cat II** nuclear material | *(use, storage and transport )* | |
| **Cat III** nuclear material | *(transport )* | |
| **Cat I** nuclear material | *(use, storage and transport )* | **A** |

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# Prescriptive approach (cont'd)

## Tasks of Licensees

- Determine the category of their material
- Select the corresponding security level
- Choose the actual technical and administrative elements in the required composition

Guidelines are issued and available on the HAEA webpage

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# Prescriptive approach

Based on the **Annex 2 (storage and use) and Annex 3 (transport)** to Government Decree 190/2011. (IX. 19.) Korm. *on physical protection requirements for various applications of atomic energy and the corresponding system of licensing, reporting and inspection* (hereinafter: GD)

**Security functions**:

- Deterrence / Prevention
- Detection
- Delay
- Response

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# Prescriptive approach (cont'd)

The security levels shall be adequate to the threat category of the nuclear and other radioactive material

→ GRADED APPROACH

The realization of the basic requirements, the defined security level and the security functions should be laid in the **Physical Protection Plan** (PPP).

The content of the PPP is **prescribed** by the GD.

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# Prevention - Development of requirements, guidelines

**Additional requirements (security measures)**

- Training and exercise
- Nuclear security culture
- Insiders
- Access control
- Physical protection of informatics, and instrumentation and control systems and components
- Testing and maintenance
- Data supply, reporting system
- Special requirements for employment, training and exercise of armed security guards who render a service in the use of nuclear energy
- Specific requirements for equipment generating ionizing radiation without a radioactive source

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# Realization of the security functions

**Deterrence/ Prevention** (according to **Annex 2** to GD)

- Warning signs
- Warning audio and light signals (only on level A)
- Artificial barriers (barrier-gates, obstructions, chicanes)
- *Accountancy and control requirements*
  - Accountancy of nuclear materials
  - *Registry of radioactive materials*

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# Realization of the security functions (cont'd)

## *Example for graded approach in deterrence*

| Level | Accountancy and control requirements [Material/period] | |
|---|---|---|
| **A** | Nuclear material | At least once a week |
| **B** | Nuclear and other radioactive material | At least once every two weeks |
| **C** | Nuclear and other radioactive material | At least once every three months |
| **D** | Nuclear and other radioactive material | At least once every six months |

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# Realization of the security functions (cont'd)

**Detection** (according to **Annex 2** to GD)

- Intrusion and attack detection system
- Video surveillance and assessment system
- *Entrance control system*
- Central alarm station (only on level A and B)

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# Realization of the security functions

(cont'd)

*Example for graded approach in detection*

| Level | Entrance controll system | | | |
|---|---|---|---|---|
| **A** | security examination instruments, especially package examiner, explosion detector, metal detector and radiation gate | reading-verifying units | biometric identifiers | access/regress points |
| **B** | | reading-verifying units | biometric identifiers | access/regress points |
| **C** | | | | |
| **D** | | | lockable doors | limitation of entrance rights |

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# Realization of the security functions
(cont'd)

**Delay**

- Passive mechanical barriers
- Active moveable mechanical barriers and associated locks
- Security stores, steel plate cabinets
- Activated barriers

**Response**

- Internal response forces and external response forces

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# Realization of the security functions

(cont'd)

*Example for graded approach in delay and response*

| Level | Delay [min] | Response [min] |
|---|---|---|
| **A** | 15 | 5 |
| **B** | 10 | 10 |
| **C** | 5 | 15 |
| **D** | 3 | - |

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# Prevention - Licensing

Regulatory license is required:

*a)* to construct the physical protection system of nuclear facility, interim store and final repository of radioactive waste, nuclear material, radioactive source and radioactive waste according to the physical protection plan,

*b)* to extend the license of the physical protection system of nuclear facility, interim store and final repository of radioactive waste, nuclear material, radioactive source and radioactive waste,

*c)* to transport nuclear material, radioactive source and radioactive waste, and

*d)* to modify a licensed physical protection system, if the modification needs modification of the physical protection plan.

The license is valid for 5 years, except for the transport of nuclear material, radioactive source or radioactive waste requiring level A or B physical protection, when the license is only valid for the specific transport.

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# Prevention - Trustworthiness checks

- Public security authorization (by police)
  - Those who work with category 1-3 radioactive sources
- Intelligence vetting
  - Those who have access to classified information above the level of Restricted

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# Detection - Inspections

**Risk informed approach**

(1) The HAEA and the police are equally authorized to inspect the **information** obtained from data supply, and the actual and effective **implementation** of the physical protection requirements and physical protection plan based on the data supply and reports.

(2) The HAEA and the police are equally authorized to inspect on the scene the **compliance** with the legal requirements and regulatory decisions related to the physical protection system.

(3) **The HAEA and the police shall coordinate** the programme of planned inspections and shall send the inspection programme, the notes and records officially taken to each other.

(4) The HAEA and the police can perform on-scene inspection **with or without preliminary information** to the obligant. The preliminary information shall contain the date, time, location and subject of the inspection, and the name and contact details of the inspector.

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# Detection - Reports

(1) **Promptly, but not later than 2 hours** after the detection the obligant shall report to the HAEA and the police any behavior or activity aiming at sabotage or unauthorized removal related to nuclear security or physical protection system.

(2) The obligant shall **examine the circumstances** of the event reported according to (1) and the operation of the physical protection system, and shall submit a report to the HAEA and the police about the results of the examination and the corrective actions not later than 30 days after the event.

(3) The obligant of nuclear facility, interim store and final repository of radioactive waste shall **annually evaluate** the performance of organizational and technical subsystems of the physical protection for the preceding year. The evaluation shall be submitted to the HAEA and the police every year until January 31.

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# Response

- Operative measures:
  - Supervision of the implementation of measures defined in the procedures of the license holders;
  - Evaluation of event investigation reports, conduct of regulatory event investigations;
  - Conduct of an enforcement procedure.
- Joint actions:
  - On-site inspection and in-situ measurements;
  - Law enforcement and nuclear forensics investigations;
  - Search of lost nuclear and other radioactive material.
- Emergency management:
  - Implementation of emergency response plans;
  - Recovery.

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*I thank You for your kind attention!*