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Guideline PP-15

**Development of the physical protection plan
for transportation of nuclear and other
radioactive material**

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2

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PREAMBLE BY THE DIRECTOR GENERAL

The Hungarian Atomic Energy Authority (hereinafter referred to as: HAEA) is a central public administration body, a government office having national authority with individual scope of task and competence acting under the direction of the Government in the field of peaceful use of atomic energy. The HAEA was founded by the Government of the Republic of Hungary in 1990 with the Govt. Decree 104/1990 (XII. 15.) Korm. on the scope of tasks and competence of the Hungarian Atomic Energy Commission and the HAEA.

It is a public task determined by law to fulfil and coordinate the regulatory tasks, independently of the organizations interested in the use of atomic energy, related to peaceful, safe use of atomic energy including nuclear safety of nuclear facilities and materials, nuclear emergency preparedness and response, nuclear security, and the related public information activities, and to propose the development of, amendment to laws related to the use of atomic energy and to give opinion to the law proposals corresponding to the use of atomic energy.

The overall safety objective to ensure the protection of the members and groups of the public as well as the environment against the hazards meant by ionizing radiation. This shall be ensured by effective safety measures implemented in the nuclear facility and maintained at the adequate level.

It is the radiation protection specific objective that the radiation exposure of the operating personnel and the public during the operation of nuclear facilities shall remain all times under the prescribed limits and as low as reasonably achievable. This shall be ensured in the case of design basis accidents and, to the extent reasonably possible, in the case of radiation exposures induced by beyond design basis and severe accidents.

It is the technical safety specific objective that the occurrence of accidents shall be prevented or avoided with high confidence and the consequences of all postulated initiating events considered in the design of the nuclear facility shall remain within the acceptable extent and the probability of severe accidents shall be adequately low.

The HAEA publishes the methods how to comply with the regulatory requirements in guidelines, which contain clear and unambiguous recommendations and which are agreed with the users of atomic energy. The guidelines are provided for the interested parties and accessible for all members of the society. The guidelines on the methods of compliance with nuclear safety, security and non-proliferation requirements are issued by the director general of the HAEA.

PREAMBLE

The internationally accepted basis of physical protection is represented by the Law Decree 8 of 1987, which promulgated the Convention on Physical Protection of Nuclear Materials approved by the IAEA in 1979 and by the Act LXII of 2008, which promulgated the Amendment to the Convention signed on July 8, 2005 in a diplomatic conference organized by the IAEA and by the Act XX of 2007 on the promulgation of the International Convention for the Suppression of Acts of Nuclear Terrorism.

The uppermost level of domestic implementation of the obligations undertaken in the international convention is represented by the Act CXVI of 1996 on Atomic Energy (hereinafter referred to as: Atomic Act). The Atomic Act contains the basic concepts of nuclear security and establishes the basis for detailed regulation of physical protection.

Govt. 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 referred to as: the Government Decree) issued as an executive order based on the authorization provided in Paragraphs q) and r) of Section 67 of the Atomic Act is the next level of the regulation system.

The HAEA is authorized to provide recommendations on the methods how the requirements determined in the laws should be complied with. These recommendations are issued in the form of guidelines published on the website of the HAEA.

So as to proceed smoothly and duly in the licensing and inspection procedures, the authority encourages the licensees to take into account the recommendations of the guidelines to the extent possible.

If methods other than that determined in the guidelines are applied, then the authority shall examine the correctness, adequacy and completeness of the applied methods in details, which might imply longer administration time, involvement of external experts and further costs.

Review of the guidelines takes place with the frequency determined by the HAEA or for the proposal of the licensees.

The regulations above are supplemented by the internal regulations of the licensees and other organizations participating in the use of nuclear energy (designers, manufacturers, etc.), which are established in harmony with their management systems.

Before applying a given guideline, always make sure whether the newest, effective version is considered. The valid guidelines can be downloaded from the HAEA's website: <http://www.haea.gov.hu>

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1. INTRODUCTION

1.1. Subject and objective of the guideline

The guideline contains recommendations on the compliance of the Government Decree.

This guideline provides a detailed guidance for those performing transportation of nuclear material, radioactive sources and radioactive wastes how to prepare the physical protection plan, and thus facilitates the compliance with the prescribed criteria.

1.2. Corresponding laws and regulations

Legal background of nuclear security requirements are provided by the Atomic Act, the Government Decree and the following regulations

- a) Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), IAEA Nuclear Security Series No. 13, IAEA, 2011.
- b) Security in the Transport of Radioactive Material, IAEA Nuclear Security Series No. 9, IAEA, 2008.

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2. DEFINITIONS

In addition to those in Article 2 of the Atomic Act and Section 2 of the Government Decree the guideline contains the following definitions.

Enhanced level of physical protection:

Ordered reinforcement of fulfilment of physical protection functions, which shall be provided by the user of atomic energy as specified in the physical protection plan.

Authority:

The HAEA and the National Police Headquarters (NPH).

Holder of nuclear material:

Who uses, stores or transports nuclear material.

Holder of radioactive waste:

Who processes, stores or transports radioactive waste.

Radioactive source:

Unsealed or sealed radiation source containing radioactive material.

Holder of radioactive source:

Who uses, stores or transports a radioactive source.

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3. RECOMMENDATIONS OF THE GUIDELINE

3.1. Basic requirements

Subsections 18 (1) and (2) contains regulation on the physical protection plan:

“Section 18

(1) The obligant shall develop a physical protection plan to describe the structure and operation of the physical protection system according to the specifications of Annex 4.

(2) The obligant, as part of the physical protection plan, shall prepare a contingency plan, which specifies the scope of possible events, including also the events that may cause inappropriate operation of the physical protection system, as well as the procedure of necessary measures and interventions.”

A regulatory license is required for the implementation of the physical protection system, a preliminary condition for which is the adequate development of a physical protection plan. According to Section 32 of the Government Decree:

“Section 32

(1) Regulatory license is required:

...

*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.*

...

*(3) **Physical protection plan** of nuclear facility, except for that equipped with a nuclear reactor of less than 1 MW thermal power, and used, stored and **transported** nuclear material, radioactive source, and of processed, stored and transported radioactive waste **shall be attached** to the license application submitted according to Paragraph (1) a)–c).*

(4) In the license application according to Paragraph (1) d) the modifications planned in the physical protection plan necessary due to the modification shall be described and it shall be demonstrated that the physical protection system will meet the requirements of this decree after the modification.”

According to Annex 4 of the Government Decree the following requirements shall be satisfied by the contents of the physical protection plan related to transport of nuclear material, a radioactive source and radioactive waste:

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1. description of the material to be transported: name, type (radioactive source, nuclear material, waste), activity, category, quantity (gross and net weight), chemical and physical properties, isotope compilation, enrichment of U-235 or U233 if nuclear material, maximum surface dose rate;
2. name, assignment and contact details of the person responsible for physical protection and participating in the transportation;
3. description of the transport means and vehicle, detailed drawing of the transport vehicle; in the case of transport of a large activity radioactive source the package applied during transportation, and photos of the relevant means and equipment;
4. primary and alternative routes, enter and exit border checkpoints in the case of transboundary transportation;
5. planned duration and schedule of the transport;
6. methods of tracking the freight;
7. organizations participating in the transportation and their tasks;
8. evaluation of physical protection training and exercises;
9. [In line with the amendment effective from March 14, 2014, this item was moved to point 2.3];
10. description of the physical protection system;
11. [In line with the amendments effective from March 14, 2014, this item was moved to the appropriate parts of other points];
12. actions to execute in the case of elevated level of physical protection;
13. system of reporting physical protection related events;
14. plans and procedures of response actions;
15. method of storage of the physical protection plan, name and positions of those having access to the physical protection plan;
16. agreements with response forces and other external organizations; special rules of conducting regulatory inspections; and
17. contingency response plan.

Annex 4 of the Government Decree determines the **obligatory** content elements of the physical protection plan; this guideline provides assistance to elaborate the particular content elements.

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In line with the law amendment effective from January 1, 2016, according to Subsection 35 (7) of the Government Decree the transport of nuclear material, radioactive sources and radioactive waste of level D **shall be registered**.

The registration related requirements according to Subsections 35 (8) and (9) of the Government Decree are:

The registration takes place in the form introduced by the HAEA, prior to the first transportation carried out within the territory of Hungary. The registration shall be delivered to the address published on the website of the HAEA. During the registration the holder of the license for transport or consignment according to the transport mode dependant agreement regulating the international shipment of dangerous goods, shall declare prior to the first transportation within the territory of Hungary that it meets the requirements established in Annex 3 related to the physical protection plan of level D protection, for the given mode of transportation.

Registration of the level D transportation shall remain valid for 5 years if the conditions are not changed.

3.2. Content elements of the physical protection plan

Content requirements of license applications to be submitted are basically determined by the properties of the nuclear and other radioactive material to be protected. Accordingly the licensing documentation grounding the provisions of A, B or C level physical protection, namely the **physical protection plan** shall be developed with the appropriate technical content according to the Government Decree.

During the development of the physical protection plan associated with the transport of nuclear or other radioactive material, other valid and effective regulatory requirements related to transportation of dangerous goods (ADR, RID, ADN etc) shall also be taken into account.

The physical protection plan for transportation shall be an attachment to the **license application** required for licensing of the physical protection system applied during the transport of nuclear materials, radioactive sources and radioactive wastes, for extending the validity of the license or for such a modification of the physical protection system that requires the modification of the physical protection plan. Physical protection license of transportation of nuclear material, radioactive sources and radioactive wastes is valid for 5 years, except for the transportation of nuclear material of Category I, II and III, and for Category 1 radioactive source, when the license is valid for the particular transport (in the case of *level A and B* physical protection).

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3.2.1. Description of the material to be transported

The description of the material to be transported shall contain the following attributes of the material:

- a) name;
- b) type (nuclear material, radioactive source or waste);
- c) activity (in Bq);
- d) category (in the case of nuclear material: I, II, or III; in the case of radioactive source: 1, 2, 3, 4, or 5; in the case of waste: 1, 2, or 3);
- e) quantity (gross and net weight in kg);
- f) chemical and physical properties (e.g. specification of chemical compound, physical condition);
- g) isotope composition;
- h) enrichment of U-235 or U-233, if the transported material is nuclear material;
- i) maximum of surface dose rate.

3.2.2. Description of the transport means and vehicle, detailed drawing of the transport vehicle; in the case of transport of large activity radioactive source the package applied during transportation, and photos of the relevant means and equipment

The name, position and contact, scope of tasks and rights, description of roles and tasks during the transport of the persons responsible for the physical protection and of all those participating in the transportation shall be determined unambiguously with special regard to the driver(s) of the vehicle and the responsible manager authorized to act. In the case of nuclear material the person responsible for the physical protection can be the designated safeguards officer, in the case of other radioactive material the radiation protection officer. If individual physical protection officer is appointed, then it is practical for him/her to cooperate with the safeguards officer and/or the radiation protection officer.

3.2.3. Description of the transport means and vehicle, detailed drawing of the transport vehicle

The description shall cover all the transport means used from the departure of the transport until the arrival to the destination (including also the

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replacement and backup transport vehicles), of which photos (and structure drawing) shall be also attached.

In the attached photos the vehicles used for the transportation shall be described, the applied physical protection systems shall be clearly visible (e.g. labels), and a photo shall be attached of the cargo hold, on which the location of the material and the mode of fixation of the transport container to the vehicle (chains, bolts etc) are clearly visible.

The description shall accurately specify the type, license plate number, dimensions, characteristic specifications and license(s) related to transportation of radioactive material. It shall be specified that what type, size and weight package is used for the material to be transported, together with the number of the valid license document (if a package design bound to regulatory license determined in a separate law is required for the transportation).

If more than one transportation mode is to be applied during the transport (intermodal e.g. railway and road) and/or if the transported material is to be forwarded (reloaded), then the description of the used vehicle in each phase of the transport shall be described.

In the case of physical protection level A and B, irrespective of the transport mode the freight shall be transported in such a vehicle, in which this material is transported exclusively.

In the case of physical protection level A open (awned) vehicle shall only be used for a freight that is heavier than 2000 kg, if it is equipped with a closing structure, opening sensor and a seal, and if the freight is fixed to the transport vehicle by chains in such a way that it can resist 10 000 N tension.

In the case of physical protection level B and C open (awned) vehicle shall only be used for a freight that is heavier than 500 kg, if theft protection is ensured.

3.2.4. Primary and alternative routes, enter and exit border checkpoints in the case of transboundary transportation

The Government Decree requires for physical protection level A and B to specify the primary and alternative routes, in the selection of which other prescriptions related to transport of dangerous goods shall also be taken into account.

The following aspects are the most important:

- using mark "M" roads if possible.

If this is not possible using of

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- roads of one digit;
- main roads of two digits.

Such routes shall be selected, which evade towns and other densely populated areas. If this is not possible, a detailed description of the route across the town shall be provided; in addition the time of transportation shall be selected so that peak traffic hours are avoided.

In the planning of the transportation route it should be considered if specific limitations exist on the transportation vehicle or on the freight, with special regard to height, width and weight limitations.

If intermodal transportation and/or reloading of the freight is necessary on the primary or alternative routes of the transportation, then the date, duration and locations of the planned reloading should be specified, as well as the names, contact details of the persons responsible for execution and coordination of the consecutive transport phases.

During longer (more than 1 hour) stops (such as night rests) the physical protection of the freight in the transport vehicle shall be in compliance with the physical protection requirements for facilities (according to the protection level of the transported material). Measures planned to provide for these arrangements shall be described in details (lights required to illuminate the parking place, cameras, method of sealing).

If a site with already appropriate physical protection is used for the stop, then a copy of the written agreement shall be attached to the physical protection plan, based on which the transport vehicle can enter the site and remain there for the given duration.

If an alternative route is considered special attention should be paid to the execution of the change from one route to the other, if it becomes necessary, in a short time and if the necessary supplies can be provided. The alternative routes should also meet the requirements on the arrival times of response forces according to the given physical protection level.

Special attention should be paid on all obvious sources of hazards, specifically to civil protests and natural hazards (such as dangers of floods, forest fire and falling of rocks). In the case of frequent similar transports regularity in selection of routes should be avoided, as appropriate.

Although in the case of level C physical protection the Government Decree does not require to specify the primary and alternative routes, but the physical protection plan should contain the aspects based on which the selection of the route could take place. In the selection of the aspects the

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frequency of the transports and the requirements for a higher protection level should be taken as basis.

3.2.5. Planned duration and schedule of the transport

The Government Decree requires for physical protection level A and B the specification of the planned time of departure (if known), but at least its time interval. In addition the planned time of arrival, as compared to the time of departure, should be given.

The number of reloading should be minimized and the systemic timing of reloading in the case of frequent transports should be avoided.

Although in the case of level C physical protection the Government Decree does not require to specify the time and schedule of the transport, but the physical protection plan should contain the aspects based on which the selection of the time of transport took place. In the selection of the main aspects, the frequency of the transports and the requirements for a higher protection level should be taken as basis.

In the case of physical protection level A, B and C, if the duration of the transport is longer than one day, then the transport should be carried out without stops if possible, and with changed vehicles, if necessary or a night stop should be preliminary planned, and if this extends one hour, then the physical protection requirements for facilities according to the physical protection needs of the freight should be satisfied. If a site with already appropriate physical protection is used, then a copy of the written agreement shall be attached to the physical protection plan, based on which the transport vehicle can enter the site and remain there for the given duration.

Staying at the same place for more than 24 hours should be avoided.

3.2.6. Tracking of the transport

Methods of tracking of the freight, in line with the given physical protection level shall be described. Such methods can be for example:

- a) the driver of the vehicle gives regular reports via mobile communication means on his/her position and condition (the frequency of this communication shall be preliminary set!), the absence of which might imply a potential alert (measures should be planned for the lack of a report);
- b) provision of a tracking system for the transport vehicle and the freight, for example a satellite (GPS) or RFID (radio frequency identification device), the emitter unit of which should be resistant to radiation and its

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electric supply should be provided on the long term with durable batteries.

3.2.7. Organizations participating in the transport and their tasks

The registration code (NYTkód) applied in the central registry of radioactive materials operated by the HAEA according to the Ministerial Decree 11/2010 (III.4.) KHEM should be specified (if exists) to unambiguously identify the submitter of the physical protection plan.

If more organizations are concerned in the transport, then all the organizations participating in the transport should be specified by the name of the persons assigned to physical protection tasks, and the name of the person(s) responsible for the coordination between the organizations, their positions, contact details, their scopes of responsibilities and rights, description of their roles and tasks in the transport, and the form of cooperation of the organizations.

Copy(ies) of contract(s) certifying the validity of the cooperation should be attached.

3.2.8. Evaluation of physical protection training and exercises

To ensure the effective operation of the physical protection system, regular physical protection training and retraining should be provided for the participants of the transports in line with the physical protection level required to apply during the transport of the radioactive material.

The following should be documented in the physical protection plan:

- a) main content elements of the training,
- b) time of last training of participants of the transport,
- c) effectiveness of the training related exercises.

3.2.9. [This item was moved to Point 2.3 according to the amendments effective from March 14, 2012.]

3.2.10. Description of the physical protection system

The equipment to ensure the following functions should be detailed in line with the given physical protection level of the freight

- a) prevention/deterrence,
- b) detection,
- c) delay,

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d) response.

It should be certified that the selected equipment and procedures comply with the technical requirements of the given physical protection level prescribed in Annex 3 of the Government Decree. A detailed description should be given on the physical protection components applied on the transport vehicle. Their roles in the physical protection system and their main properties should be described.

The description should contain how the physical protection of the freight contained in the transport vehicle would be protected during a longer (than 1 hour) stop to guarantee that it satisfies the physical protection of the given level (i.e. the physical protection level of the transported material) related to facilities.

If the transport takes place with an open (awned) transport vehicle then the description should contain how the given physical protection level requirements are complied with (e.g. theft protection).

Based on Subsection 29 (5) of the Government Decree, technical design or installation of the physical protection system providing physical protection level A, B or C should be performed by only such a person, which has a valid authorization to design and install property protection system.

Deviation from the content requirements of Annex 3 of the Government Decree according to Subsection 32 (9) of the Government Decree is possible only if such a solution ensuring at least an equivalent protection is described in the physical protection plan, which is approved by the HAEA and the NPH.

3.2.11. [This item was moved to parts of other points according to the amendments effective from March 14, A 2012.]

3.2.12. Measures to apply in the case of elevated level of physical protection

The HAEA orders for the introduction of elevated level of physical protection if the threat suddenly increases. Fast implementation, supplementary measures should be developed for such cases. In the case of a threat exceeding the design basis threat the physical protection can be supplemented with state instruments or assistance. (For example with the involvement of the police).

It should be considered as a part of the elevated level of physical protection, if the implemented level of physical protection solution is higher than the corresponding determined minimum required protection levels and the requirements associated with the protection levels, or the redundancy of

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which is higher than the minimum necessary, or which uses a solution different from those listed.

If elevated level of physical protection is introduced, then a possible option is that the freight does not depart. If this is not the selected method of protection for the case of elevated threat, then it is not necessary to develop a higher level physical protection. The designated physical protection officer should be informed by the transport manager of the elevated level of threat without delay, who should decide on any further action.

It is to be considered that the turn back of the transport is practical only if the departure station is closer than the destination.

If the conditions for that increased threat are not met any more, then the HAEA will order on termination of the elevated level of protection.

3.2.13. Order of reporting physical protection related events

A predetermined notification order should be developed for the occurrence of a threat or attack against the transport. A continuous and reliable mobile communication connection should be available at all times for the personnel of the transport vehicle at all levels of physical protection. The list of persons to be notified should be clearly defined; their contacts should be easily accessible (for example hung inside the vehicle). If a transport-security checkpoint (Transport Security Centre) is established, then the driver of the transport vehicle should notify also the Transport Security Centre after alerting the response forces.

Order of reporting of events occurring during the transport should also be specified. According to Subsection 33 (1) of the Government Decree promptly, but not later than 2 hours after the detection, the obligant shall report to the HAEA and the NPH any physical protection related (aiming at sabotage or unauthorized removal) events (including the necessary break of the transport operation). In such a case the notification phone number of the HAEA to be called all around clock is +36 20 547 5656.

Based on Subsection 33 (2) of the Government Decree the obligant shall investigate the circumstances of the reported event and the physical protection system, and shall submit a report to the HAEA and the NPH about the results of the investigation and the corrective actions not later than 30 days after the event.

3.2.14. Response action plans and procedures

If an unanticipated event affects the transport (e.g. transport accident, attack, technical error etc.), then predetermined procedures should be available for

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the various anticipated and credible scenarios. These should detail the response actions to be taken by the transport personnel. Technical errors of the physical protection system should also be considered.

3.2.15. Storage method of the physical protection plan, name and position of persons having access

The physical protection plan can be a classified document. The number of those having access to it should be minimized every case. Place, method of storage, name and position of persons with authorized access should be specified.

The HAEA and the NPH should be listed as authorities with access.

3.2.16. Agreements with response forces and other external organizations; special rules for the case of a regulatory inspection

As part of the physical protection measures, depending on the physical protection level of the given freight, the transport vehicle may require live (armed) escort. If more organizations are participating in the transport, then the form of cooperation, share of responsibilities and the handing over of the supervision over the freight should be determined. For example the radio frequency used by the various organizations and response forces or the method of encryption of the radios/mobile phones should be clarified. A copy of the effective agreement(s) certifying the cooperation should be attached to the physical protection plan.

As part of the agreements with the response forces, preliminary information should be provided to the response forces of all planned stops along the transport route and also of any unplanned break of the transport operation by specifying its exact location and time.

Realization of physical protection is basically the task of the Obligant (implementer(s) of the transport, participant(s) of the transport) and not the official task of the police. Consequently the police should not occur in the physical protection plan as an external on-call response force, unless a civil right contract is concluded with the police to fulfil this task. In this case the contract should be referred in the physical protection plan.

Regulatory inspection can be carried out by the HAEA (principal authority) and the NPH (co-authority), during which they inspect the correctness of the data provided during the physical protection data supply in the frame of on-scene (on-site or on-transport) inspection. The inspection can be unannounced. Procedure of conduct of regulatory inspections required by

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law should be specified by designating the person(s) to be present during the inspection.

During an on-site regulatory inspection, beyond the physical protection aspects, the freight and the transport vehicle, the appropriate preliminary information exchange and the ability to receive the transport are inspected. During that, first of all the assistance of the Obligant's responsible manager and competent personnel are required in addition to the personnel of the transport vehicle.

If the regulatory inspection takes place during the transport, the primary partner of the authority should be the driver of the transport vehicle. If during the inspection the opening of the cargo is necessary, the conditions for that should be specified in the physical protection plan.

3.2.17. Contingency plan

A contingency response plan should be developed by the description of response actions (procedure to apply in the case of unauthorized removal of the transported material or its attempt, notification process etc.) to be taken for the cases of elevated level of threat, accident, technical problem or unanticipated event (e.g. obstacle for the transport vehicle).

4. ANNEXES

4.1. Guideline in Hungarian and English on compliance with the content requirements for the physical protection plan related to transport of nuclear material, a radioactive source and radioactive waste based on Section 2 of Annex 4 of the Government Decree

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Guideline on compliance with content requirements based on Annex 3 and Section 2 of Annex 4 of Govt. 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 referred to as Govt. Decree) the physical protection plan (hereinafter referred to as: PPP) related to transport of nuclear material, radioactive source and radioactive waste					
Content requirements of the PPP based on Section 2 of Annex 4 of the Govt. Decree	General requirements		Level A	Level B	Level C
2.1. Description of the material: name, type (nuclear material, radioactive source or waste), activity, category, quantity (gross and net weight), chemical and physical properties, isotope composition, enrichment or depletion of U-235 or U-233 or plutonium if it is nuclear material, maximum of surface dose rate. (Govt. Decree Sections 4 and 7)	Categorization should take place according to Tables 1-3 of Annex 1 of <i>Govt. Decree</i> . If the activity of the transported materials may change, it is recommended that an R value-interval appropriate for the given protection level is given, for example: to satisfy the $R < 1000$ condition, if Level C protection should be provided for the transported material. In addition to the detailed description of the material to be transported also the data of the transport container should be specified (type, dimension, license document identifier....)		Tables 1-3 of Annex 1 of <i>Govt. Decree</i> then Sections 4 and 7 of <i>Govt. Decree</i>		
		<i>Annex 3 of Govt. Decree</i>			
		title of chapter	other relevant sections		
2.2. Name, position, contact details of the physical protection officer and the participants of the transport	All the persons participating in the transport (e.g.: drivers, responsible manager, escort personnel) should be listed together with their contact details. (All the persons listed here should receive physical protection training according to Point 2.8)				
2.3. Description of the transport means and vehicle, detailed drawing of the transport vehicle; in the case of transport of large activity radioactive source the package applied during transportation, and photos of the relevant means and equipment;	All the vehicles used in the transport together with their related data (e.g. type, size, licence plate, licences etc.) should be listed. Photos should be attached of all, on which the fulfilment of the physical protection functions described in Point 2.10 are well visible (e.g.:	Exclusive vehicle use	20.	20.	
		Open vehicle	21.	22.	22.

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	deterrence labels on the vehicle door; elements of detection etc.)				
2.4. Primary and alternative routes, enter and exit border checkpoints in the case of transboundary transport	Main aspects of selection of transport route(s) should be described. (e.g.: priority to motorway use, most frequently used routes etc.)	Route selection	25. 26. 27. 28.	25. 26. 27. 28.	
Guideline on compliance with content requirements based on Annex 3 and Section 2 of Annex 4 of Govt. 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 referred to as Govt. Decree) the physical protection plan (hereinafter referred to as: PPP) related to transport of nuclear material, radioactive source and radioactive waste					
Content requirements of the PPP based on Section 2 of Annex 4 of the Govt. Decree (cont.)	General requirements (cont.)		Level A	Level B	Level C
		<i>Annex 3 of Government Decree</i>			
		title of chapter	other relevant sections		
2.5. Planned duration and schedule of the transport	Principles of scheduling the transport should be described. If a stop exceeds 1 hour the physical protection requirements for facilities should be ensured (except for sabotage protection).	Transport time	29. 29.1 29.2 29.2.1. 29.2.2. 29.3.	29. 29.1. 29.2. 29.2.1. 29.2.2. 29.3.	30. 30.1. 30.2. 30.3
2.6. Methods to track the freight	Tracking methods applied during the transport should be described. If there is no applied tracking system, for example in the case of level C, preliminary determined, regular using of mobile tools can be acceptable.	Communication	6. 6.1. 6.2.	7. 7.1. 7.2.	8.
		Security inspections	24.	24.	24.
		Monitoring system	48.	48.	
2.7. Organizations participating in the transport and their tasks		Information protection	10. 10.1.	10. 10.1.	12. 12.1.

Development of the physical protection plan for transportation of nuclear and other radioactive material

	Tasks and scope of responsibility of the participants of the transport should be described (see Point 2.2.).	preliminary notifications	10.2. 10.3. 11.	10.2. 10.3. 11.	12.2.
		Escort	13. 13.1. 13.2. 13.3.	14. 14.1. 14.2. 14.3.	
		Security inspections	23. 24.	23. 24.	24.
		Physical protection knowledge	19.	19.	19.
Guideline on compliance with content requirements based on Annex 3 and Section 2 of Annex 4 of Govt. 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 referred to as Govt. Decree) the physical protection plan (hereinafter referred to as: PPP) related to transport of nuclear material, radioactive source and radioactive waste					
Content requirements of the PPP based on Section 2 of Annex 4 of the <i>Govt. Decree</i>	General requirements (cont.)		Level A	Level B	Level C
			<i>Annex 3 of Government Decree</i>		
		title of chapter	other relevant sections		
2.8. Evaluation of physical protection training and exercises (<i>Govt. Decree</i> Section 21)	The physical protection training should be described including the date and results (passed/not passed) of examination of the participants of the transport.	Physical protection knowledge	16. 19.	16. 19.	17. 19.
2.9. In line with the amendment effective from March 14, 2014, this item was moved to point 2.3					
2.10. Description of the physical protection system.	The basic principles of the <i>prevention, deterrence, detection, delay, response</i> protection function should be described (description and photos or drawings). A detailed description of the applied physical protection system should be provided and all should be described if different type or various physical protection systems are used. The described physical	PREVENTION, DETERRENCE			
		Warning signs, labels	1. 1.1. 1.2. 1.3. 1.4. 2.	3. 3.1. 3.2. 3.3. 3.4.	4. 4.1. 4.2.
		DETECTION	31.	35.	39.

Development of the physical protection plan for transportation of nuclear and other radioactive material

	<p>protection system should comply with the technical requirements (of the given protection level) prescribed in Annex 3 of the Government Decree. Deviation from the content requirements of Annex 3 of the Government Decree according to Subsection 32 (9) of the Government Decree is possible if such a solution ensuring at least an equivalent protection is described in the physical protection plan, which is approved by the HAEA and the NPH.</p>	Alerting system for unauthorized access and attack	32. 32.1. 32.2. 32.3. 33. 33.1. 33.2. 33.3. 33.4. 33.5. 34. 34.1. 34.1.1. 34.1.2. 34.1.3. 34.2. 34.3. 34.3.1. 34.3.2. 34.3.3. 34.4. 34.4.1. 34.4.2.	36. 36.1. 36.2. 36.3. 37. 37.1. 37.2. 37.3. 38. 38.1. 38.1.1. 38.1.2. 38.1.3. 38.2.	40. 40.1. 40.2. 40.3. 41. 41.1. 41.2. 41.3. 42. 42.1. 42.1.1. 42.1.2. 42.1.3. 42.2.
Guideline on compliance with content requirements based on Annex 3 and Section 2 of Annex 4 of Govt. 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 referred to as Govt. Decree) the physical protection plan (hereinafter referred to as: PPP) related to transport of nuclear material, radioactive source and radioactive waste					
Content requirements of the PPP based on Section 2 of Annex 4 of the <i>Govt. Decree</i>	General requirements (cont.)		Level A	Level B	Level C
		<i>Annex 3 of Government Decree</i>			
		title of chapter	other relevant sections		
2.10. Description of the physical protection system. (cont.)	The basic principles of the <i>prevention, deterrence, detection, delay, response</i> protection function should be described (description and photos or drawings). A detailed description of the applied physical protection system should be provided and all should be described if different type or various physical protection systems are used. The	Surveillance system	45. 46. 46.1. 46.2. 46.3. 47. 47.1. 47.2.	45. 46. 46.1. 46.2. 46.3. 47. 47.1. 47.2.	49. 50. 50.1. 50.2. 50.3. 51. 51.1. 51.2.

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	described physical protection system should comply with the technical requirements (of the given protection level) prescribed in Annex 3 of the Government Decree. Deviation from the content requirements of Annex 3 of the Government Decree according to Subsection 32 (9) of the Government Decree is possible if such a solution ensuring at least an equivalent protection is described in the physical protection plan, which is approved by the HAEA and the NPH.	Transport-security check point (Security Centre)	53. 55.	54. 55.	
		Delay			
		Transport vehicle doors and storage sheet cabinet doors	56. 56.1. 56.2. 56.3. 57.	58. 58.1. 58.2. 58.3. 59.	60. 60.1. 60.2. 61.
		Transport vehicle door locks and storage sheet cabinet locks	63. 63.1. 63.2. 63.3.	64. 64.1. 64.2. 64.3.	65. 65.1. 65.2.
Guideline on compliance with content requirements based on Annex 3 and Section 2 of Annex 4 of Govt. 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 referred to as Govt. Decree) the physical protection plan (hereinafter referred to as: PPP) related to transport of nuclear material, radioactive source and radioactive waste					
Content requirements of the PPP based on Section 2 of Annex 4 of the <i>Govt. Decree</i>	General requirements (cont.)		Level A	Level B	Level C
		<i>Annex 3 of Government Decree</i>			
		title of chapter	other relevant sections		

Development of the physical protection plan for transportation of nuclear and other radioactive material

2.10. Description of the physical protection system. (cont.)		Transport vehicle body, storage sheet cabinet	66. 66.1. 66.2. 66.3. 66.4. 66.5. 66.6.	67. 67.1. 67.2. 67.3. 67.4. 67.5. 67.6.	68. 68.1. 68.2. 68.3. 68.4. 68.5.
RESPONSE			70.	71.	72.
2.11. In line with the amendment effective from March 14, 2014, this item was moved to point 2.3.					
2.12. Measures to apply in elevated level of physical protection [Govt. Decree 18 (3) and 29 (2)]	It is acceptable to apply a protection higher than required as part of the elevated level of protection. The response actions planned to execute for the case of elevated threat during the transport should be described.				
2.13. Order of reporting of physical protection related events [Govt. Decree 33 (1) and (2)]	All physical protection related events should be reported to the members of the list in the PPP and to the HAEA and the NPH within the time specified in the Govt. Decree.	Communication	6.2	7.2.	8.
2.14. Plans and procedures of response actions [Govt. Decree 18 (2)]	Response actions planned to execute if unanticipated events occur should be described. (e.g. transport accident, technical problem, attempt of intentional removal).	Communication	6.3.	7.3.	8.
Guideline on compliance with content requirements based on Annex 3 and Section 2 of Annex 4 of Govt. 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 referred to as Govt. Decree) the physical protection plan (hereinafter referred to as: PPP) related to transport of nuclear material, radioactive source and radioactive waste					
Content requirements of the PPP based on Section 2 of Annex 4 of the Govt. Decree	General requirements (cont.)		Level A	Level B	Level C

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		<i>Annex 3 of Government Decree</i>			
		title of chapter	other relevant sections		
2.15 The method of storage of the physical protection plan, name and positions of the persons with access	The <i>PPP</i> can be a classified document, the number of persons with access should be minimized.				
2.16. Agreements with the response forces, other external organizations; special rules for conducting regulatory inspections (<i>Govt. Decree 34</i>)	If an other company provides the escort or response forces for the transport, then a copy of the valid agreement should be attached and the cooperation planned for the transport should be described. If a regulatory inspection takes place during the transport then the <i>PPP</i> should contain the tasks and scope of responsibilities.	Escort	13. 13.1. 13.2. 13.3.	14. 14.1. 14.2. 14.3.	
		Response	70.	71.	72.
2.17 Contingency plan	Response actions and responsibilities should be determined for the contingencies occurring during the transport.				

Deviation from the content requirements of Annex 3 of the Govt. Decree according to Subsection 32 (9) of the Govt. Decree is possible only if such a solution ensuring at least an equivalent protection is described in the physical protection plan, which is approved by the HAEA and the NPH.

4.2. SAMPLE

Sample physical protection plan for a transport requiring Level B physical protection

The sample has been developed for transport of radioactive sources, if nuclear material or radioactive waste is (also) among the materials to be transported then the plans should be developed accordingly.

Development of the physical protection plan for transportation of nuclear and other radioactive material

PHYSICAL PROTECTION PLAN OF THE [TRANSPORTER]

according to Govt. Decree 190/2011. (IX. 19.) Korm.

Prepared by:
(physical protection officer)

Verified by:

Approved by:
(responsible manager)

Date of preparation: [DD, MM, YYYY]

[Unique identifier of the physical protection plan]

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radioactive material**

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Development of the physical protection plan for transportation of nuclear and other radioactive material

INTRODUCTION

According to paragraph 32 (1) c) of Govt. Decree 190/2011. (IX. 19.) Korm. (hereinafter referred to as: *Government Decree*) the transport of radioactive material requires a license granted according to the *Government Decree*. The physical protection plan to be developed according to Subsection 18 (1) of the *Government Decree* should be attached to the physical protection license application to be submitted to the Hungarian Atomic Energy Authority. This plan describes the structure and operation of the physical protection system applied during the transport and as part of the plan an action plan is developed to determine the list of possible events including the events causing inadequate technical operation of the physical protection system and the procedure of necessary actions and interventions.

The [TRANSPORTER] uses the below described Level B physical protection system during the transport of radiation sources. The submission is an attachment to the licence application according to Subsection 18 (1) of the *Government Decree* submitted to the Hungarian Atomic Energy Authority.

The development of physical protection licensing documentation for the transport of radioactive material takes into account the related requirements of the effective technical annexes of the agreement on the international transport of dangerous goods on road (hereinafter referred to as: ADR).

1. REQUIRED PHYSICAL PROTECTION LEVEL

According to Subsection 7 (3) of the *Government Decree* a **Level B physical protection shall be provided** based on the maximum activity of the radioactive material transported by the [TRANSPORTER].

2. THE PHYSICAL PROTECTION PLAN

2.1. DESCRIPTION OF THE MATERIAL TO BE TRANSPORTED

Radioactive content to be transported:	[ISOTOPE]
Activity:	[TOTAL ACTIVITY]
Packaging:	[TYPE OF PACKAGING]
Isotope weight:	g
Gross weight of the package:	t
Chemical properties:	
Physical properties:	

Development of the physical protection plan for transportation of nuclear and other radioactive material

Maximum surface dose rate at the surface of the package: mSv/h

Categorization according to Table 2 of Annex 1 of the *Government Decree*:

$$R = \sum_i \frac{A_i}{D_i}$$

((Example: in case of a Co-60 source of 300 TBq activity

$$R = \frac{A_{Co-60}}{D_{Co-60}} = \frac{300TBq}{0,03TBq} = 10^4 \text{))}$$

Since the value of R is higher than 1000, the transport is of **Category 1** according to Table 2 of Annex 1 of the *Government Decree*.

In line with Paragraph 7 (3) b) of the *Government Decree* a **Level B physical protection** shall be provided by the [TRANSPORTER] during the transport of this radioactive source.

2.2. Name, position and contact data of the persons responsible for physical protection and participants of the transport

Person responsible for physical protection at the [TRANSPORTER]:

[NAME, CONTACT DATA] I_FV

Driver of the vehicle: [NAME, CONTACT DATA] Sz_GKV

...((please list if there are more))

Escorting person of the transport vehicle: [NAME, CONTACT DATA] Sz_GKK

...((please list if there are more))

Driver of the escort vehicle: [NAME, CONTACT DATA] K_GKV

...((please list if there are more))

The person responsible for communication between the personnel of the transport vehicle and the escort vehicle of the [TRANSPORTER], and with the destination ([NAME OF THE SITE]:

[NAME, CONTACT DATA] I_KM

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Their rights can be found in their description of duty, which is in the [NUMBER OF ANNEX].

2.3. Description of the transport means and vehicle, detailed drawing of the transport vehicle; in the case of transport of a large activity radioactive source the package applied during transportation, and photos of the relevant means and equipment

Authority identifier of the license of the package design: [IDENTIFIER]

Valid until: [VALIDITY DURATION]

Radioactive content: [ISOTOPE, ACTIVITY]

Maximum surface dose rate: mSv/h

Transport mode:

The package prepared for transportation is in full compliance with the related effective prescriptions of the ADR.

The transport takes place by the closed truck owned by the [TRANSPORTER], which has the appropriate licences. Data:

License plate number: Type:

Number of transport license: Validity time:.....

((please list if there are more))

Further specification documentation and photos of the vehicle used for the transport are contained in [NUMBER OF ANNEX].

The transport vehicle is exclusively used to transport the isotope listed in Section 2.1. A rail system is developed in the cargo hold of the transport vehicle to fix the transport container.

Maximum surface dose rate on the outer surface of the transport vehicle: mSv/h

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Maximum surface dose rate at 2 m from the outer surface of the transport vehicle: mSv/h

The transport vehicle and its personnel meet all the relevant requirements of the ADR.

2.4. Primary and alternative routes

The primary route of the transport (E_UV):
[TRANSPORTER] site (address: ...) – X1 road – X2 bridge – X3 road – [DESTINATION] site (address: ...)

Alternative road of the transport (A_UV):
[TRANSPORTER] site (address: ...) – Y₁ road – Y₂ bridge – Y₃ road – [DESTINATION] site (address: ...)

Threat that would enforce to change over to the alternative route is not known.

Safe options to change over to alternative route: Z₁ road, Z₂ road or Z₃ road. The changeover does not take more than 10 minutes in case of every options. If the changeover would become necessary, but the safe options cannot be used the transport shall turn back immediately.

On the preceding day of the transport the I_GKK checks, using the escort vehicle, the applicability of the selected primary and secondary route for the planned transport.

The previous transport by the [TRANSPORTER] to the [DESTINATION] did not take place via the current primary route.

2.5. Planned duration and schedule of the transport

Date of the transport: [DD, MM, YYYY] ((or an interval of maximum 30 days))

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The transport departs from the [TRANSPORTER] site:

[TIME]

Planned arrival time of the transport to [DESTINATION]: [TIME]

No stops are planned except for unforeseen traffic reasons or technical problem.

2.6. Methods of tracking the transport

The participants of the transport (I_FV, Sz_GKV, Sz_GKK, K_GKV, I_KM) are equipped with continuously and reliably operating mobile phones, and the vehicles taking part in the transport are equipped with satellite tracking system, the emitter unit of which is radiation resistant, and whose electricity supply is provided for at least 12 hours from own battery. The signals of the tracking system are continuously monitored by the Transport Security Centre (Security Centre) of the [TRANSPORTER]. During the transport I_FV and I_KM is staying in the Security Centre.

I_KM is continuously monitoring the state of the shell protection and area protection.

According to section 3.10.2. the alert-signal generated by shell protection or area protection – in addition to the light and sound signals for the escort personnel, and the alert sent to the Security Centre – directly notifies the police as well.

The list of contact persons who need to be notified in an emergency is placed in the vehicle at a well visible place. The list is:

Name:.....

Phone number:

Position:

...((please list if there are more))

In addition, the contact details of the police, ambulance, fire brigade and the HAEA are also at the driver's disposal.

The driver of the vehicle shall confirm the operability and charged state of the mobile communication device before departure of the transport.

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2.7. Organizations participating in the transport and their tasks

The registration code of the [TRANSPORTER] according to Ministerial Decree 11/2010 KHEM, obtained when registered in the central register of radioactive materials operated by the HAEA: [CODE].

No external organization participates in the transport. *((If other organization participates in the transport then they need to be listed here, and a copy of the valid cooperation agreement shall be attached to the plan.))*

The [TRANSPORTER] creates a temporary organizational structure to coordinate and operate the transport related physical protection functions in the following manner. During the transport, the office of I_FV functions as transport-security centre (Security Centre). I_FV and I_KM shall stay here from the departure of the transport until its completion.

I_KM before the transport:

- informs the [DESTINATION] on the details of the transport, the planned transport method and the anticipated time (date, time) and location (which entrance of the site) of arrival;
- requests confirmation from the [DESTINATION] if the [DESTINATION] is willing to receive the transport and if it is prepared to do so, in addition if it can take over the freight immediately;
- informs the HAEA on the transport within the deadline prescribed in the resolution;
- checks the operability of the satellite tracking system;
- launches a communication test with the personnel of the transporter and escort vehicle.

I_KM during the transport:

- tracks the progress of the transport via the satellite tracking system;
- establishes phone connection with Sz_GKK every 15 minutes and requests information of the position of the transport;
- continuously monitors the state of shell protection and area protection and promptly notifies the I_FV if an alert-signal is generated.

During the transport an escort vehicle travels behind the transport vehicle, from which the escort personnel is able to oversee the transport on a permanent basis.

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Prior to loading the transport vehicle the physical protection checking of the vehicle shall be performed, then the vehicle shall be stored at a secured place while the loading completes. After the transport is over the transport vehicle shall be closed and sealed and continuously checked until it departs.

2.8. Evaluation of physical protection training and exercises

The participants of the transport shall receive obligatory physical protection training at their recruitment and then **annually**. Physical protection exercises are parts of the physical protection training, during which the participants can learn and practice the application of technical means of the shell and area protection and the management of contingencies.

During the physical protection training the following is described:

[TRAINING MATERIAL]

-
-

Persons who received physical protection training:

Name: Date of training:
result:

...((please list if there are more))

Training was performed by:

Name:

The I_FV, prior to commencement of the transport, verifies if the participants are aware of the physical protection requirements and if they took part in the training.

A physical protection drill will be used to confirm the operability of the physical protection functions, adequacy of the response capabilities, which will be conducted within a year and repeated every year later on. During the annual drill the participants learn or practice the use of the technical means of the shell and area protection and the management of contingencies.

2.9. [In line with the amendment effective from March 14, 2014, this item was moved to point 2.3.]

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2.10. Description of the physical protection system

The [TRANSPORTER] ensures Level B physical protection of the transport according to the *Government Decree*, via deterrence/prevention, detection, delay and response physical protection functions and an effective coordination of these with the implementation details below.

2.10.1. Prevention, deterrence

The transport vehicle, in addition to the large label and the orange plate indicating class 7 according to the ADR, is equipped with the warnings indicating the physical protection of the vehicle, the forbidden tools and activities and the authorization to manage. These signs are well visible with open door of the cargo hold as it is demonstrated by a photo [NUMBER OF ANNEX].

2.10.2. Detection

The application of a notification system guarantees that the freight is accessible only to those authorized; if unauthorized access or attack is detected the notification system activates; the alert has a sound component, thus it directly notifies the personnel inside the transport vehicle, who notify the response forces.

Components of the notification system:

- movement sensor in cargo hold (make, type etc.)
- opening sensor (make, type etc.)
- break sensor (make, type etc.)
- wreck sensor (make, type etc.)

The notification system detects any intrusion attempt through the door of the transport vehicle and unauthorized approach to the freight within the cargo hold. A full scope shell and area protection is provided via their parallel operation. Position of the components of the notification system can be seen on the attached photo [ANNEX].

The freight is provided with a security seal, the traceless removal, movement or replacement of which is impossible. The seal has a unique identifier and it is fixed so that it cannot break even during an accident.

Attributes of the security seal:

-,

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-,
-

A photo is attached of the security seal [NUMBER OF ANNEX].

A video surveillance system is installed inside the transport vehicle (make, type etc.) that is applicable to monitor the freight and activates when the door of the cargo hold opens. The components of the surveillance system:

- camera,
- image transmitter,
- image display in the driver cabin and in the Security Centre,
-

A Security Centre for transport security is established at the site of the [TRANSPORTER], where I_FV and I_KM maintain communication with the transport.

Prior to departure from the site of the [TRANSPORTER] and after arrival to the [DESTINATION] site Sz_GKK checks the intactness of the freight and the security seal(s).

The notification signal of the shell protection or the area protection, in addition to the light and sound notification of the escort personnel and notification of the Security Centre, directly notifies the police as well.

2.10.3. Delay

Technical attributes and parameters of the transport vehicle as detailed in Point 2.3 that are important from the aspects of the relevant requirements of the *Government Decree* ensure that the doors of the transport vehicle are strongly resistant against mechanical impacts and guarantee a minimum of 10 minutes breakthrough delay against a specially equipped intruder. There is no other opening on the cargo hold of the transport vehicle or on the storage cabinet.

The resistance of the door case and the frame structure of the transport vehicle against an attack is equivalent with that of the door structure.

The door locks of the transport vehicle are designed for 10-minute breakthrough, intrusion resistance. Intactness of the locks and seals of the transport vehicle are checked by the participants of the transport prior to departure, during the transport and at the destination.

The body of the transport vehicle is such a single-wall armour sheet where the thickness of the covering steel sheets is at least 6 mm and there is at least

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30 mm distance between the two walls. The destructive testing of the steel sheet showed 24 RU for total breakthrough and 15 RU for partial breakthrough. The lock structure of the cargo hold door of the transport vehicle ensures secured locking in one direction through a locking-gear.

The lock is Category A lock according to EU qualification. The key cannot be pulled out in open state of the lock.

Drilling protection of the lock structure is ensured by an drilling prevention sheet of a minimum 60 HRC toughness.

The cargo is fixed against an 5000 N wrecking force, of which a photo is attached [NUMBER OF ANNEX].

2.10.4. Response

In the manner detailed in point 2.10.3. the alert notification generated by the shell protection or the space protection, in addition to the light and sound signals for the escort personnel, and the alert sent to the Security Centre – the system directly notifies the police as well. Irrespective of that, the Sz_GKV should send a notification of any attempt of unauthorized removal of the freight to the external response forces and the Security Centre according to the contact list provided by the I_FV.

Sz_GKV can request assistance to respond to any other emergency via the contact details in the list.

If the communication between the transporter and escort vehicle terminates, the Security Centre shall notify the external response forces, who are required to realize the response in 10 minutes.

The external response forces, in order to prevent any unauthorized removal of the freight, should proceed according to their own internal procedures, to which immediate assistance and information is provided by the [TRANSPORTER].

2.11. [In line with the amendments effective from March 14, 2014, this item was moved to the appropriate parts of other points.]

2.12. Measures to apply in the case of elevated level of physical protection

If the HAEA orders for elevated level of physical protection, then enforced protection to the freights being on their way is promptly requested. If the freight is closer to the departure site than to the destination, the transport

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should turn back. The planned transports will be delayed until the HAEA orders for termination of elevated level of protection.

2.13. Order of reporting physical protection related events

A continuously and reliably operating mobile communication device is at the disposal of the driver of the transport vehicle.

The K_GKV contacts the Sz_GKV and I_KM every 30 minutes during the transportation, as well as the local authorities and response forces concerned along the transport route until the handing over of the freight.

Beyond that, the I_KM contact via phone the I_GKK and requests information of the position of the transport.

Additionally, the escort contacts the addressee, the local authorities and response forces concerned along the transport route until the handing over of the freight.

According to section 2.10.2 the alert notification generated by the shell protection or the space protection, in addition to the light and sound signals for the escort personnel, and the alert sent to the Security Centre – the system directly notifies the police.

If the communication between the transporter and escort vehicle terminates, the Security Centre shall notify the external response forces.

Of all events that concern physical protection or a physical protection system (e.g. unauthorized removal or its attempt promptly, but not later than within 2 hours, the HAEA and the NPH will be notified. The event will be investigated within 30 days and the investigation report will be submitted to the above authorities.

2.14. Plans and procedures of response actions

Response actions related to prevent unauthorized removal are discussed in Sections 2.6. and 2.13..

If a transport accident occurs, police interventions shall be requested promptly and the Security Centre shall be notified. In such a case the freight should be brought back to the [TRANSPORTER] site using a backup vehicle, if necessary.

If a technical problem occurs the Security Centre shall be notified promptly. In such a case the freight should be brought back as soon as possible to the [TRANSPORTER] site or to the [DESTINATION], using a backup vehicle, if

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necessary. The decision on that should be made by the responsible manager of the [TRANSPORTER].

If other emergency occurs the Security Centre shall be notified promptly, where based on the information of the specific situation, with the involvement of experts if necessary, the responsible manager of the [TRANSPORTER] shall decide on the further actions considering the proposals of the I_FV. The priority option should always take care of protection of the freight.

2.15. Method of storage of the physical protection plan, name and position of the persons authorized to access

Only the following, authorized persons can access the physical protection plan approved by the authority:

[NAME, POSITION]

...((please list if there are more))

The *HAEA* and the NPH competent employees also have authorization to read the document.

The responsible manager of the [TRANSPORTER] stores the plan in a safe at [LOCATION].

2.16. Agreements with the response forces, other external organizations; special rules for conducting regulatory inspections

The protection of the freight is provided based on the contract between the [TRANSPORTER] and the [ESCORT]. A copy of the contract is attached as [NUMBER OF ANNEX].

Two persons stay always in the transport vehicle. The transport vehicle is followed by an escort vehicle that will travel behind the transport vehicle and continuously monitor the freight. [NUMBER] persons will travel in the escort vehicle. The vehicles travel in a row as a convoy.

The most probable locations of regulatory inspections are the [TRANSPORTER] site or the [DESTINATION] site.

During an inspection at the [DESTINATION] site, beyond the physical protection aspect inspection of the freight and the transport vehicle, the

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correctness of the preliminary information exchange and the ability to receive the freight will be inspected. During that, first of all the assistance of the responsible manager of the [DESTINATION] and his/her competent colleagues will be necessary in addition to the personnel of the transport vehicle.

During an inspection at the [TRANSPORTER] site beyond the physical protection aspect inspection of the freight and the transport vehicle, it is also possible to inspect the Security Centre, where the primary partner of the authority will be the I_FV and the responsible manager of the [TRANSPORTER].

If the regulatory inspection takes place during the transport between the [TRANSPORTER] site and the [DESTINATION] site, the primary partner of the authority will be the Sz_GKV. If it will be necessary to open the cargo hold of the transport vehicle, it can be done only under security provisions of the police, personally by the I_FV or the responsible manager of the [TRANSPORTER], or an employee requested by him/her.

2.17. Contingency plan

If elevated level of threat is ordered the provisions of section 2.12 should be followed.

In the case of a transport accident or technical problem the provisions of section 2.14 should be followed.

The police and the concerned authorities will be promptly informed if unauthorized removal of the freight is detected and the provisions of section 2.13 will be followed.

After unauthorized removal, further actions will be proposed by the responsible manager of the [TRANSPORTER] to the responsible commander of the external response forces, taking into account the opinion of the I_FV.

If other emergency occurs the Security Centre shall be notified promptly, where based on the information of the specific situation, with the involvement of experts if necessary, the responsible manager of the [TRANSPORTER] shall decide on the further actions considering the proposals of the I_FV. The priority is always to take care of the protection of the freight.

4.3. SAMPLE

Sample physical protection plan for a transport requiring Level C physical protection

The sample has been developed for transport of radioactive sources, if nuclear material or radioactive waste is (also) among the materials to be transported then the plans should be developed accordingly.

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PHYSICAL PROTECTION PLAN OF THE [TRANSPORTER]

according to Govt. Decree 190/2011. (IX. 19.) Korm.

Developed by:
(physical protection officer)

Verified by:

Approved by:
(responsible manager)

Date of development: [DD, MM, YYYY]

[Unique identifier of the physical protection plan]

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INTRODUCTION

According to paragraph 32 (1) c) of Govt. Decree 190/2011. (IX. 19.) Korm. (hereinafter referred to as: *Government Decree*) the transport of radioactive material requires a license granted according to the *Government Decree*. The physical protection plan to be developed according to Subsection 18 (1) of the *Government Decree* should be attached to the physical protection license application to be submitted to the Hungarian Atomic Energy Authority. This plan describes the structure and operation of the physical protection system applied during the transport and as part of the plan an action plan is developed to determine the list of possible events including the events causing inadequate technical operation of the physical protection system and the procedure of necessary actions and interventions.

The [TRANSPORTER] uses the below described Level C physical protection system during the transport of radiation sources. The submission is an attachment to the licence application according to Subsection 18 (1) of the *Government Decree* submitted to the HAEA.

The development of physical protection licensing documentation for the transport of radioactive material took into account the related requirements of the effective technical annexes of the agreement on the international transport of dangerous goods on road (hereinafter referred to as: ADR).

1. REQUIRED PHYSICAL PROTECTION LEVEL

According to Subsection 7 (4) of the *Government Decree* a **Level C physical protection shall be provided** based on the maximum activity of the radioactive material transported by the [TRANSPORTER].

2. PHYSICAL PROTECTION PLAN

2.1. Description of the material to be transported

The [TRANSPORTER] in a transport vehicle routinely transports on public road the following **sealed radioactive sources** simultaneously:

[NUMBER OF PIECES, NAME OF ISOTOPE, ACTIVITY]

...(please list if there are more)

Categorization according to Table 2 of Annex 1 of the *Government Decree*:

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$$R = \sum_i \frac{A_i}{D_i}$$

((EXAMPLE:

2 pc, Ir-192 sealed radioactive source with a maximum activity of **4.5 TBq**;

1 pc, Co-60 sealed radioactive source with a maximum activity of **3.7 TBq**;

1 p, Se-75 sealed radioactive source with a maximum activity of **3.5 TBq**.

$$R = 2 \times \frac{A_{Ir-192}}{D_{Ir-192}} + \frac{A_{Co-60}}{D_{Co-60}} + \frac{A_{Se-75}}{D_{Se-75}} = 2 \times \frac{4.5TBq}{0.08TBq} + \frac{3.7TBq}{0.03TBq} + \frac{3.5TBq}{0.2TBq} = 365.8 \quad))$$

Since the value of R falls between 1000 and 10, the **Category** of the transported radioactive sources is **2**, thus the [TRANSPORTER] provides **Level C physical protection** according to Paragraph 7 (4) b) of the *Government Decree*.

((If the scope of transported radioactive sources is difficult to be determined or will change in the future, then the following solutions is recommended.))

The [TRANSPORTER] transports the radioactive sources in a transport vehicle together, on public road, in a way that the following condition is always met after the categorization performed according to Table 2 of Annex 1 of the Government Decree:

$$R = \sum_i \frac{A_i}{D_i} < 1000$$

Based on this the [TRANSPORTER] provides **Level C physical protection** according to Paragraph 7 (4) b) of the Government Decree.

Gross weight of the package: kg

Isotope weight: g

Isotope weight: g

Isotope weight: g

Chemical properties:

Physical properties:

Isotope compilation:

Maximum surface dose rate at the surface of the package: mSv/h

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radioactive material**

2.2. Name, position and contact data of the persons responsible for physical protection and participants of the transport

Responsible manager at the [TRANSPORTER]: [NAME, PHONE NUMBER, E-MAIL]

Person responsible for physical protection at the [TRANSPORTER] is all times the radiation protection officer, currently: [NAME, PHONE NUMBER, E-MAIL]

His/her rights can be found in his/her job description, which is attached as [NUMBER OF ANNEX].

The vehicle drivers participate also in the transport:

[NAME, POSITION, PHONE NUMBER]

...(please list if there are more)

2.3. Description of the transport means and vehicle, detailed drawing of the transport vehicle; in the case of transport of large activity radioactive source the package applied during transportation, and photos of the relevant means and equipment

The [TRANSPORTER] transports exclusively on public road the isotopes listed in Section 2.1, by the vehicles in his/her ownership that have the required licences:

License plate:..... Type:

Number of transport license: Validity time:.....

...(please list if there are more)

B(U) type packages used for the transportation:

id:

number of license document:

validity time of license document:

external dimensions:

weight:

Type packages used for transportation:

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external dimensions:

weight:

...((please list if there are more))

A rail system is developed in the cargo hold of the transport vehicle to fix the transport containers.

Photos describing the transport vehicle and its details are contained in [NUMBER OF ANNEX]

2.4. Primary and alternative routes

The *Government Decree* does not require specification of the route, but the following aspects are followed during the transport: use of mark „M” roads when possible. If this is not possible then one-digit or two-digit main roads are used.

The transports take place according to the orders. The potential hazards (e.g.: [CONSIDERED HAZARDS]) are taken into account in the selection of the route, the regular use of the same route is avoided.

2.5. Planned duration and schedule of the transport

The time of transport depends on the actual orders, the time of departure is not known in advance.

The freight arrives to the addressee within a maximum time of [TIME]. No stops over 1 hour are planned. Time regularity during our similar transports is avoided.

2.6. Methods of tracking the transport

The driver of the transport vehicle is equipped with continuously and reliably operating mobile phone (the driver of the vehicle shall confirm the operability and charged state before departure of the transport), via which he/she can be contacted any time and he/she can provide information on the exact location of the vehicle.

The list of contact persons who needs to be notified in an emergency is in the vehicle at a well visible place. The list is:

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Name:.....Phone number:

Position:

Name:.....Phone number:

Position:

...(please list if there are more)

In addition, the contact details of the police, ambulance, fire brigade and the *HAEA* are also at the disposal of the driver.

The protection of the transport vehicle is continuously checked throughout the transport: the authorized employee checks the intactness of the freight at the departure and before restart after each stop. If deviation is found he/she notifies the responsible manager.

The actions according to Section 2.13 are commenced without delay, if unauthorized removal of the freight is detected.

2.7. Organizations participating in the transport and their tasks

The registration code of the [TRANSPORTER] according to Ministerial Decree 11/2010 KHEM, obtained when registered in the central register of radioactive materials operated by the *HAEA*: [CODE].

Before the transport [TRANSPORTER] inform the [DESTINATION] of the attributes of the transported material, the planned transport method and of the anticipated time and location of arrival. The transport does not depart until it is confirmed that the destination is able to receive the transport at delivery.

During the transport only the driver of the vehicle stays in the transport vehicle, who ensures during the travel and in case of stops that the physical protection system determined in Section 2.10 is fully operating.

No other organization participates in the transport of the radioactive material by the [TRANSPORTER]. *((If other organizations participate, then they should be listed here and a copy of the valid cooperation agreement should be attached to the plan.))*

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2.8. Evaluation of physical protection training and exercises

The [TRANSPORTER] provides physical protection training to the newcomers, and holds physical protection re-training **biannually** for each employee participating in the transport.

During the physical protection training the following is described:

[TRAINING CURRICULUM]

-

-

Persons who received physical protection training:

Name: Date of training:
result:

Persons who received physical protection training:

Name: Date of training:
result:

...(please list if there are more)

Training was performed by:

Name:

A physical protection drill will be used to verify the operability of the physical protection functions, adequacy of the response capabilities, which will be conducted within a year and repeated every year later on. During the annual drills the participants learn or practice the use of the technical means of the shell and area protection and the management of contingencies.

2.9. [In line with the amendment effective from March 14, 2014, this item was moved to point 2.3.]

2.10. Description of the physical protection system

The [TRANSPORTER] ensures Level C physical protection of the transport based on the maximum activity of the transported radioactive materials, which provides the effective harmony of deterrence, prevention, detection, delay and response physical protection functions with the implementation details below.

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2.10.1. Prevention, deterrence

The transport vehicle, in addition to the large label and the orange plate indicating class 7 according to the ADR, is equipped with warning signs indicating the radiation hazard, the forbidden tools and activities. These signs are well visible with open door as it is demonstrated by a photo [NUMBER OF ANNEX].

A transport log is being held on the isotopes transported on the given day, from which it is unambiguous that when and which vehicle transported which isotope and who travelled in the vehicle. At return of the vehicle to the site the designated person [RADIATION PROTECTION OFFICER OR HIS/HER DEPUTY] checks the log which should be confirmed by signing the log.

The driver of the transport vehicle is equipped with an operable mobile phone, via which he/she can request assistance. The list of persons to be notified in these cases can be found in the passenger space. Those in the list appeared in Section 2.6.

The driver of the vehicle received physical protection training, and certified his/her knowledge in a satisfactory manner.

Protection of the transport vehicle is being continuously checked during the transportation: at departure and before restart after each stop the authorized employee checks the intactness of the freight.

2.10.2. Detection

The application of a notification system ensures that the freight is accessible only to those authorized; if unauthorized access or attack is detected the notification system activates; the alert has a sound component, thus it directly notifies the personnel inside the transport vehicle, who notify the response forces.

Components of the notification system:

- movement sensor in cargo hold (make, type etc.)
- opening sensor (make, type etc.)
- break sensor (make, type etc.)
- wreck sensor (make, type etc.)

The notification system is full scope, it detects any intrusion attempt through the door of the transport vehicle and unauthorized approach to the freight within the cargo hold. The applied space protection is trap-like. Position of

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the components of the notification system can be seen on the attached photo.

The freight is provided with a security seal, the traceless removal, movement or replacement of which is impossible. The seal has a unique identifier and it is fixed so that it cannot break or move even during an accident.

- Attributes of the security seal:

-,
-,
-

A photo is attached of the security seal [NUMBER OF ANNEX].

A video surveillance system is installed inside the transport vehicle (make, type etc.) that is applicable to monitor the freight and becomes active when the door of the cargo hold opens. The components of the surveillance system:

- camera,
- image transmitter,
- image display in the driver cabin,
-

2.10.3. Delay

Technical attributes and parameters of the transport vehicle as detailed in Point 2.3 that are important from the aspects of the relevant requirements of the *Government Decree* ensure that the doors of the transport vehicle are resistant against mechanical impacts by traditional manual tools and guarantee a minimum of 5 minutes breakthrough delay against an intruder equipped with manual tools. The resistance of door case and the frame structure of the transport vehicle against an attack is equivalent with that of the door structure.

The door locks of the transport vehicle are designed for 5-minutes breakthrough, intrusion resistance security doors. Intactness of the locks and seals of the transport vehicle are checked by the participants of the transport prior to departure and at the destination.

The body of the transport vehicle is such a single-wall sheet where the thickness of the covering steel sheets is at least 2 mm and the lock structure

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of the cargo hold door of the transport vehicle ensures secured locking in one direction through a locking-gear.

The key cannot be pulled out in open state of the lock.

Drilling protection of the lock structure is ensured by an anti-drilling sheet of a minimum 60 HRC toughness.

The transport is fixed against 5000 N wrecking force, of which a photo is attached [NUMBER OF ANNEX].

2.10.4. Response

The routes of the transports and the stops during the transport are designed so that the response can be realized by the participants of the transport in 15 minutes. If necessary the police is notified.

2.11. [In line with the amendments effective from March 14, 2014, this item was moved to the appropriate parts of other points.]**2.12. Measures to apply in the case of elevated level of physical protection**

If the HAEA orders for elevated level of physical protection then, if the freight is closer to the departure site than to the destination, the transport is turned back promptly. The planned transports will be delayed until the state orders for termination of elevated level of protection.

2.13. Order of reporting physical protection related events

A continuously and reliably operating mobile communication device is available at the driver of the transport vehicle. In the case of threat or attack against the transport the driver of the vehicle, if possible after the response, notifies the police and all those contact persons, who are described in Section 2.6.

If the driver of the transport vehicle does not initiate the contact with the designated officer of the [TRANSPORTER] in the predetermined time, then this officer notifies the police.

Of all events that concern physical protection or a physical protection system (e.g. unauthorized removal or its attempt) we will promptly, but not later than

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within 2 hours, notify the HAEA and the NPH (the 24 hours a day alert number of the HAEA is: +36 20 547 5656; NPH: 107,112). The event will be investigated within 30 days of its occurrence and the investigation report will be submitted to the above authorities.

2.14. Plans and procedures of response actions

Response actions related to prevent unauthorized removal are discussed in Sections 2.6. and 2.13..

If a transport accident occurs, police interventions shall be requested promptly and the responsible manager of the [TRANSPORTER] shall be notified. In such a case the freight should be brought back as soon as possible to the [TRANSPORTER] site using a backup vehicle, if necessary. The decision to do so shall be made by the responsible manager of the [TRANSPORTER].

If a technical problem occurs, the driver of the transport vehicle shall promptly notify the responsible manager of the [TRANSPORTER]. In such a case the freight should be brought back as soon as possible to the [TRANSPORTER] site or to the destination whichever is more reasonable, using a backup vehicle, if necessary. The decision on that should be made by the responsible manager of the [TRANSPORTER].

If the physical protection system breaks down the responsible manager of the [TRANSPORTER] shall be notified promptly, who shall decide on the future of the freight depending on the extent of the failure.

2.15. Method of storage of the physical protection plan, name and position of the persons authorized to access

Only the following, authorized persons can access the physical protection plan approved by the authority:

[NAME, POSITION]

[NAME, POSITION]

...((please list if there are more))

The HAEA and the NPH competent employees have authorization to read the document.

The responsible manager of the [TRANSPORTER] stores the plan in a safe at [LOCATION].

2.16. Agreements with the response forces, other external organizations; special rules for conducting regulatory inspections

No response forces are employed for the protection of the freight of the [TRANSPORTER], the driver of the vehicle can fulfil the response function.

The most probable locations of regulatory inspections are the [TRANSPORTER] site or the [DESTINATION] site.

During an inspection at the [DESTINATION] site, beyond the physical protection aspect inspection of the freight and the transport vehicle, the correctness of the preliminary information exchange and the ability to receive the freight will be inspected. During that, first of all the assistance of the responsible manager of the [DESTINATION] and his/her competent colleagues will be necessary in addition to the personnel of the transport vehicle.

During an inspection at the [TRANSPORTER] site, irrespective of being announced or unannounced inspection, the responsible manager of the [TRANSPORTER] or his/her deputy shall be present at the inspection. The [TRANSPORTER] shall make available all the documentation requested by the inspectors of the HAEA and/or the NPH and shall ensure that the inspectors are able to confirm the correctness of what is described in the physical protection plan.

If the regulatory inspection takes place during the transport, then the primary partner of the authority will be the driver of the transport vehicle. If it will be necessary to open the cargo hold of the transport vehicle, it can be done only by the physical protection officer or by the responsible manager of the [TRANSPORTER].

2.17. Contingency plan

If elevated level of threat is ordered the provisions of section 2.12 should be followed.

In the case of a transport accident or technical problem the provisions of section 2.14 should be followed.

The police and the concerned authorities will be promptly informed if unauthorized removal of the freight is detected and the provisions of section 2.13 will be followed.

After unauthorized removal, further actions will be proposed by the responsible manager of the [TRANSPORTER] to the responsible commander

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of the external response forces, taking into account the opinion of the physical protection officer.

If any other emergency occurs the responsible manager of the [TRANSPORTER] shall be notified promptly, who, based on the information of the specific situation, with the involvement of the physical protection officer and other experts if necessary, shall decide on the further actions. The priority option should always take care of protection of the freight.