

NRRHP

National Radiation Emergency Plan



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Introduction

In the Czech Republic (hereinafter referred to as the “Czech Republic” or “ČR”), a crisis management system has been introduced, which includes a system of emergency preparedness and response to radiation extraordinary events. It has been anchored in 1997 by Act No. 18/1997 Coll., on Peaceful Utilisation of Nuclear Energy and Ionising Radiation (Atomic Act) and on Amendments and Additions to Related Acts. This Act defined the concept of emergency preparedness, on-site and off-site emergency plan and emergency planning zone (hereinafter referred to as “ZHP”). It also stipulated the obligations of holders of a licence, i.e. operator of nuclear power plants (hereinafter referred to as “NPP”) or workplaces with ionising radiation sources, to ensure emergency preparedness and in the event of a radiation incident (hereinafter referred to as “RN”), or a radiation accident (hereinafter referred to as “RH”) during activities performed by the operator under the issued licence. Fundamental laws for the needs of crisis management in the Czech Republic are as follows: Constitutional Act No. 110/1998 Coll., on Security of the Czech Republic, Act No. 320/2015 Coll., on Fire Rescue Service of the Czech Republic and on Amendments to Certain Acts (Fire Rescue Service Act) , Act No. 239/2000 Coll., on the Integrated Rescue System and on Amendments to Certain Acts, Act No. 240/2000 Coll., on Crisis Management and on Amendments to Certain Acts (“Crisis Act”), Act No. 241/2000 Coll., on Economic Measures for Crisis Situations and on Amendments to Certain Related Acts, Act No. 222/1999 Coll., Defence Provision of the Czech Republic, and Act No. 12/2002 Coll., on State Aid to Recover Areas Affected by Natural or Other Disaster and on Amendment to Act No. 363/1999 Coll., on Insurance and on Amendment to Some Related Acts (Insurance Act), as amended (Act on State Aid to Recover Areas).

In 2017, a new Atomic Act came into force - i.e. Act No. 263/2016 Coll., the Atomic Act (hereinafter referred to as the “Atomic Act”). One of the areas in which the changes in nuclear legislation have been reflected is also the area of emergency preparedness and crisis management - now uniformly called “radiation extraordinary event management”. For the assessment of the severity of radiation extraordinary events (hereinafter referred to as “RMU”)

and for the purposes of graded preparedness for response to RMU, the Atomic Act defines first degree radiation extraordinary event, radiation incident and radiation accident.

In accordance with the standards of the International Atomic Energy Agency (hereinafter referred to as "IAEA") and European legislation, other categorisations related to RMU are included in Czech legislation, namely threat categories of equipment by mode and place of their origin and magnitude of potential impacts. This categorisation is used to define specific requirements for radiation extraordinary event management for five different threat categories. Threat category A includes a power nuclear installation; threat category B includes a nuclear installation, which is not included in threat category A, and category IV workplace other than workplace with a nuclear facility where radiation accident may occur. Threat category C includes a nuclear installation or workplace with ionising radiation sources where radiation accident cannot occur and threat category D includes an activity in exposure situations, including finding, misuse or loss of a radionuclide source or transport of radioactive or fissile material, which cannot cause a radiation incident or a radiation accident in an unpredictable location, and thus accidental exposure. Threat category E then includes areas on the territory of the Czech Republic where protective actions for the public could be potentially implemented as a result of a radiation accident occurred in a nuclear installation or at workplace with ionising radiation sources situated on the territory outside the Czech Republic.

Experience has shown that the Czech Republic must be prepared for all types of RMU, whether they occurred in any of the Czech nuclear installations or anywhere on the territory of the Czech Republic with impacts that may be sufficiently severe to take measures to protect the health of the general public outside the established emergency planning zones, where such measures are not planned in advance, prepared or technically provided in any way. Such situations should be taken into account and strategies for their management should be established.

One of the requirements of nuclear legislation is the development of the so-called National Radiation Emergency Plan (hereinafter referred to as the "NRHP"), which is a plan drawn up for the territory of the Czech Republic outside nuclear installation grounds or category IV workplaces to prepare for the management and implementation of a response to a radiation accident with an impact outside the emergency planning zone and, where appropriate, to a radiation accident

which may occur abroad or anywhere in the Czech Republic, including emergency planning zone, and whose management is not dealt with in off-site emergency plans (hereinafter referred to as "VHP").

Such RH, i.e. RMU, which requires the adoption of measures to protect the population, may be, in addition to an accident in a nuclear installation, an accident in radioactive material (hereinafter referred to as "RaL") transport, explosion of a dirty bomb - i.e. explosives contaminated with RaL, dispersion of radioactive material from an orphan, lost or stolen radionuclide source, etc. These events can only have a local and, to the extent of damage, limited impact on both health and property of persons, which can be managed at the level of one affected region, but can also have much more significant impacts to the extent of more than one region, thus affecting even more persons with a potentially serious threat to their health. The method and extent of dealing with such events will always depend on the specific conditions, the amount, form and composition of RaL released into the environment.

The initial evaluation of the situation and in particular the monitoring of the real radiation situation will show how much forces and resources will need to be involved in dealing with the situation, whether the situation can be managed at the level of one region with declaration of the state of emergency by the governor or whether it will be necessary to declare the state of emergency and deal with the situation at the central level with activation of the Central Crisis Staff (hereinafter referred to as the "ÚKŠ"). The NRHP primarily deals with situations where the RMU occurred is already classified as an RH and it is necessary to take protective actions for the population in the area beyond the borders of one region or ZHP and the Government will most likely declare a state of emergency. However, as mentioned above, everything will depend on the evaluation of the particular real situation and the situations in the NRHP are therefore described rather typically, in which case it is impossible to determine with certainty in advance whether they will ultimately result in declaration of the state of emergency or whether they will eventually be managed at the regional level by means of crisis measures introduced by the competent governor.

The NRHP also contains a strategy of optimised radiation protection in the administration of the contaminated areas after an emergency exposure situation (hereinafter referred to as "NES") changes to an existing exposure situation (hereinafter referred to as "EES") and it is necessary to

ensure recovery of the area and infrastructure in the area as part of remedy after RH. The recovery of the area after RH must be based on the requirements of the Act on State Aid to Recover Areas Affected by Natural or Other Disaster¹ as well as the basic principles of radiation protection - in particular optimisation, where all the procedures laid down must, in particular, pursue the basic objective, so that the measures adopted ultimately bring more benefits than harms. The NRHP is thus the first document in the Czech Republic to deal with this issue in more detail.

The NRHP summarizes the responsibilities of public authorities and competent crisis management bodies for ensuring measures to introduce urgent and follow-up protective actions outside the established ZHP with the aim of restricting accidental exposure of the population in the Czech Republic as a result of RH occurred in the Czech Republic or abroad, and which has effects on the territory of the Czech Republic. The NRHP is a strategic document respecting existing valid legislation in the field of crisis management, while applying adequately the competencies set out therein at the general level to the conditions and needs specific to radiation accident management. VHP and other documents used to determine specific procedures for emergency management and including events with sources of ionising radiation (e.g. crisis plans of regions and municipalities with extended competences, type plans, type activities and standard operating procedures of IZS units) remain valid and together with the NRHP create a comprehensive system for managing the impacts of RMU in the Czech Republic in all variants. The NRHP can thus significantly improve the Czech Republic's preparedness for this type of event and bring it to a high level in this area, comparable to the most developed European countries.

According to § 209 d) of the Atomic Act, the State Office for Nuclear Safety (hereinafter referred to as "SÚJB") shall, in cooperation with the Ministry of the Interior (hereinafter referred to as the "MV"), draw up the NRHP for threat categories A, B, D and E in accordance with § 213 of the same Act, and in accordance with § 4 (1) I) for the territory of the Czech Republic outside nuclear installation grounds or category IV workplaces to prepare for the management and implementation of a response to a radiation incident or radiation accident with an impact outside the emergency planning zone. The NRHP is developed only for those threat categories for which there is a possibility of RH. All entities responsible for the implementation of the NRHP shall comply with the NRHP no later than two years after its approval by the Government.

The requirements for the content of the NRHP are set out in Annex 8, Decree No. 359/2016 Coll., on details of ensuring radiation extraordinary event management.

The NRHP, and thus the readiness of individual actors to perform the tasks assigned to them for threat category A, must be regularly verified in the form of exercises, at least once every four years with a link to the VHP. NRHP exercise for other threat categories will be conducted as the need arises. The evaluation and results of the exercises will be used to modify and update the NRHP to correspond to the current real situation in the field of RMU management and reflect new scientific and practical knowledge in this area.

1 Act 12/2002 Coll., on State Aid to Recover Areas Affected by Natural or Other Disaster and on Amendment to Act No. 363/1999 Coll., on Insurance and on Amendment to Some Related Acts (Insurance Act), as amended

OBJECTIVES OF THE NATIONAL RADIATION EMERGENCY PLAN

The main objective of the NRHP is, first of all, to specify measures to protect the health of the general public in the event of RH with impacts outside the established ZHP and then to clearly define the responsibilities of individual public authorities for these measures. By defining this responsibility, individual public authorities shall carry out preparations for the measures they provide within their competence, both at the methodological and operational levels - i.e. by drawing up the necessary methodological instructions, operating procedures, or other necessary documents, as well as at the level of securing all the material resources needed to perform the set tasks. To this end, it is also necessary to plan sufficient financial resources and, last but not least, to prepare qualified personnel for the effective and proper performance of the specified tasks and measures.

The NRHP specifically addresses situations where the RMU is an RH with impacts outside the areas of established ZHP and at the request of the governor of one or more regions, or the head of the SÚJB KČ, the Prime Minister convenes the ÚKČ and declares a state of emergency. Along with the declaration of the state of emergency, the necessary crisis measures are defined and their implementation is subsequently ensured by the competent public authorities within their competencies. The NRHP lists these competencies related to the management of RH, even outside the ZHP. Urgent and follow-up protective actions (§ 104 of the Atomic Act) are similar both for the area of ZHP and outside the area of ZHP, and their implementation is decided by the same public authorities. However, the population outside the ZHP is not prepared for these measures in advance and is not even instructed in the form of information transmitted in advance. The necessary forces and resources are also not earmarked for such a situation. However, at present, with advanced communication technologies, information can be transmitted relatively quickly and efficiently to any area on the territory of the Czech Republic. The NRHP sets out notification schemes for these events, as well as general options for taking protective actions outside the ZHP.

Another objective of the NRHP is to establish a so-called strategy for optimised radiation protection for the administration of the contaminated area, the contamination of which is the

result of RH, including measures to enable housing and the resumption of social and economic activities. This strategy includes, inter alia, criteria and procedures for defining contaminated areas by contamination level and for setting out the conditions for further use of those areas, where possible. It also contains a specification of measures to ensure the protection of the population within the defined contaminated areas, the establishment of appropriate reference levels, the principles of protection of emergency workers, and the principles of recovery of the area after RH. The strategy does not set out detailed procedures or methodologies for the implementation of specific measures; these must be or in most cases are already set out in the relevant documents of the public authorities responsible for individual measures.

The NRHP also describes communication with foreign countries, including neighbouring countries, in the case of mutual notification of RH and the measures taken. In particular, it is in the common interest to maintain consistency in notifying the population concerned and recommending protective actions, especially in border areas, to prevent different approaches from giving rise to unnecessary uncertainties or concerns for the population.

A. Introduction

A.1. List of emergency planning zones (ZHP)

nuclear installations or category IV workplaces established in the Czech Republic

Based on the performed safety analyses of nuclear installations and category IV workplaces situated on the territory of the Czech Republic, two ZHPs are currently established. One ZHP is in the vicinity of the Temelín Nuclear Power Plant (hereinafter referred to as the “Temelín NPP”) and the other ZHP is in the vicinity of the Dukovany Nuclear Power Plant (hereinafter referred to as the “Dukovany NPP”).

The ZHP of the Dukovany NPP was established by Decision of the Czechoslovak Atomic Energy Commission No. 180/91 of 4 September 1991 as an area within a distance of 20 km from the Dukovany NPP, provided that notification of authorities and organisations and warning of the population are provided within 20 km, sheltering and application of iodine prophylaxis for the population and regulation of the movement of persons also within a distance of 20 km, and planning and preparation for the evacuation of the population are provided within a distance of 10 km from the Dukovany NPP. There are four power reactors of the VVER 440 type, each with a current output of 510 MWe, an interim spent fuel storage and a spent nuclear fuel storage within the ZHP of the Dukovany NPP.

The ZHP of the Temelín NPP was established by Decision of the State Office for Nuclear Safety No. 311, ref. no. 4715/4.0/97/Prz, of 5 August 1997. This Decision establishes the ZHP of the Temelín NPP for measures to notify authorities and organisations and warn the population and prepare measures for sheltering, iodine prophylaxis and for regulation of the movement of persons within the given area of a circle with a radius of 13 km with the centre given by the containment of Temelín NPP Unit 1 and the areas of municipalities, which are situated at the border of the circle. Planning and preparation for the evacuation of the population are provided in the inner part of the ZHP within a distance of 5 km from the Temelín NPP. A drawing of the border is given in Annex to the Decision. There are two power reactors of the VVER 1000 type, each with a current output of 1082 MWe, and a spent nuclear fuel storage within the ZHP of the Temelín NPP.

Depending on the course or expected development of RH and, where appropriate, depending on the results of radiation situation monitoring (hereinafter “MRS”), the above-mentioned urgent protective actions may be implemented at distances greater than anticipated by VHP of NPP.

A.2. List of the areas taken into account where the threat category E has been identified of

The probability that RH at a nuclear installation (hereinafter referred to as “JZ”) abroad will necessitate the introduction of urgent or follow-up protective actions for the population of the Czech Republic is very low, but not entirely negligible.

In terms of distance of foreign nuclear power plants from the border with the Czech Republic, account should be taken, in particular, of nuclear units of the VVER 440 type operated in the Slovak Republic at the Jaslovské Bohunice NPP (two units) located 37 km from the border, the Mochovce NPP (two units in operation and two units ready for start of operation) located 86 km from the

border, and at the Paks NPP in the Republic of Hungary (four VVER 440 units and two newly built VVER 1200 units) located 268 km from the Czech border.

South-west of the Czech Republic, account should be taken, in particular, of the potential impacts of RH of the Isar 2 NPP, located 88 km from the border, or other NPPs operated or decommissioned in the Federal Republic of Germany.

With regard to the surface area of the Czech Republic, potential impacts of RH on any area in the Czech Republic cannot be ruled out from the listed set of NPPs, in particular with regard to the need to introduce urgent protective actions for sheltering and iodine prophylaxis, or from follow-up actions for restriction of the use of feed and the use of local food and drinking water from local sources.

The entire territory of the Czech Republic is the area with the potential impact of an event of threat category E.

A.3. Description of the organisation of crisis management of central authorities

for dealing with a radiation accident, when the state of emergency is declared by the Government of the Czech Republic or, where appropriate, the Prime Minister

The Crisis Act stipulates the competence and authority of state authorities and regional and local authorities and the rights and obligations of legal and natural persons in preparing for and dealing with crisis situations, including liability for breaches of these obligations, in which case the procedures in the area of crisis management are standardised by the Ministry of the Interior.

The Government has established ÚKŠ for crisis management as its working body included in the system of bodies of the National Security Council (hereinafter referred to as “BRS”), which ensures operational coordination, monitoring and evaluation of the implementation of the measures taken by the Government, ministries and other administrative authorities and regional and local authorities to prevent the occurrence of or to deal with crisis situation or other serious situation, and provides support for the activities of crisis management bodies of regional and local authorities and bodies of regional and local self-government authorities.

Ministries and other central authorities (hereinafter referred to as “ÚSÚ”) have established a crisis staff (hereinafter referred to as “KŠ”) for crisis management as a working body for the preparation and management of crisis situations, whose composition and duties shall be determined and material, organisational and administrative conditions for its activities shall be provided by the minister or the head of another central authority. They draw up a crisis plan, which contains a

summary of crisis measures and procedures for dealing with a crisis situation; ensure, at the request of another ministry or other central authority, the execution of professional work arising from their competence, and, at request, provide documents to ministries, regional authorities and municipalities with extended competences.

Regional and local self-government authorities - regional authorities and authorities of municipalities with extended competences (hereinafter referred to as “ORP”) set up a crisis staff to deal with crisis situations as working bodies of the governor/mayor of the municipality with extended competence. The governor coordinates the activities in dealing with the crisis situation in the region and ensures the implementation of crisis measures of the Government and the fulfilment of duties imposed by the Government. The mayor of the municipality with extended competence coordinates the activities in dealing with the crisis situation in the administrative district of the ORP, performs the duties imposed by the governor and participates in the activities in dealing with the situation in the same way as the mayors of the municipalities.

A.3.1. Radiation accidents addressed within the NRHP

The NRHP includes the following three basic situations of RH with potential impacts outside the established ZHP and with the potential for declaring a state of emergency. In most cases, the mentioned RH will mean the occurrence of such a crisis situation, in which the contamination of

the affected area and the need to introduce urgent or follow-up protective actions or subsequent start of the activities leading to the recovery of the area after RH cannot be ruled out.

A.3.1.1. Radiation accident occurred at a nuclear power plant in the Czech Republic with impacts beyond the boundaries of ZHP (threat category A)

Initial information on the occurrence of RH comes from the NPP operator (see scheme in Figure 3 in Annex C.1). RH is dealt with according to the previously prepared procedures of the on-site and, within the ZHP, off-site emergency plan. Based on information about the state of the art, it is possible to make estimates of the source term (i.e. the time course of the release and the amount of RaL released into the environment) and make advance forecasts of the impacts of the release and prepare the necessary protective actions, including estimates of areas where the actions will have to be implemented. At the request of the Chairperson of SÚJB and/or the governor of the region, the Prime Minister activates the ÚKŠ, the state of emergency is declared, the necessary

crisis measures are set out and, based on the suggestion of NPP operator or KŠ SÚJB, protective actions are introduced by the competent crisis management bodies.

In the event that the need to take protective actions outside the ZHP is evaluated, the components of the integrated rescue system (hereinafter referred to as "IZS") and crisis management bodies will act in accordance with the relevant emergency or crisis plans and internal documents. Emergency plans of a region are drawn up for the area of a given region on the basis of analyses of risks that may occur in its area.

A.3.1.2. Radiation accidents, other than radiation accidents of a nuclear power plant

(for example, in radioactive material transport, explosion of a dirty bomb, explosion of an improvised nuclear installation, dispersion of radioactive material from an orphan, lost or stolen source) with local impact anywhere in the Czech Republic, including ZHP (threat category D)

Initial information on the occurrence of RMU comes from the affected area to the Operational and Information Centre of the General Directorate of the Fire Rescue Service of the Czech Republic (hereinafter referred to as "OPIS GR HZS"), Operational and Information Centre of the Fire Rescue Service of the region concerned (hereinafter referred to as "OPIS HZS"), or the contact point of

SÚJB either on the basis of the results of MRS or on the basis of a notification (see scheme in Figure 4 in Annex C.1).

In the case of this RMU, it begins with the detection of the release of RaL into the environment. The method of detecting the presence of RaL can be different - through the Early Detection Network (hereinafter referred to as "SVZ"), on-site monitoring, actions by IZS units or other indications. The amount and composition of this RaL is not known at first. It is therefore absolutely necessary to initiate an emergency MRS, which is managed and coordinated by SÚJB, immediately upon the suspicion of the presence of RaL.

Based on the results of the emergency MRS and in accordance with the relevant internal documentation of SÚJB, KŠ SÚJB shall issue proposals for the introduction of protective actions. As part of the rescue and remedial work, all available forces and resources of the IZS units will be used according to the IZS alarm plans. The Government, the competent ministries, the governor and the mayors of the municipalities shall immediately inform the population concerned of the occurrence of RH and of the measures to be taken. Emergency and crisis plans and internal documentation are followed in dealing with the RH.

A.3.1.3. Radiation accidents occurred at nuclear power plants or other nuclear installations abroad with impacts on the territory of the Czech Republic (threat category E)

Initial information on the occurrence of RH comes from the country in which it occurred or where a change in the radiation situation in the Czech Republic is indicated through the MRS¹. The information is received by the OPIS GR HZS and SÚJB (see Figure 5 and other schemes in

point C.1.). As in point A.3.1.2, it will be necessary to immediately initiate the emergency MRS and based on the results, KŠ SÚJB shall propose the necessary protective actions. The implementation of protective actions will be managed from the central level by the Government of the Czech Republic using the BRS or ÚKŠ.

¹ See: <https://www.sujb.cz/monitorovani-radiacni-situace/>

A.3.2. Implementation of urgent protective actions

The central premise of the RH management system, if it occurs despite all safety measures, is the effort to minimise its impacts on human health and the environment. In the real situation, this means taking measures on the part of the crashed JZ and making every effort to suppress the symptoms of RMU and regain control of the crashed JZ so as to minimise the release of RaL into the environment under the circumstances.

If RaL is released, the responsible crisis management authorities must be notified immediately, the population must be informed and warned, and measures must be taken as soon as possible to protect the health of people in the vicinity of the crashed JZ to ensure that their effective doses from exposure are as low as reasonably achievable under the circumstances. At the same time,

the protection actions introduced must do more good than bad, and must therefore be justified and optimised. Potential protective actions are based on the basic physical principles of radiation protection - time, shielding and distance - i.e. staying close to the radiation source for as short a time as possible, using effective and efficient shielding and being as far away from the radiation source as possible. The introduction of urgent protective actions also monitors the restriction or prevention of internal contamination of persons by limiting the inhalation of contaminated air.

The procedures for the implementation of protective actions are addressed in detail in the measure tabs of the Type Plan for Radiation Accident. Type plans are developed in accordance

with the Methodological Instruction of MV¹ drawn up on the basis of Government Resolution No. 369 of 27 April 2016² for extraordinary events, which were evaluated as events for which it is necessary to develop type plans in advance on the basis of threat analyses. The Type Plan for

1 <http://www.hzscr.cz/soubor/analyza-hrozeb-zprava-pdf>

2 <https://apps.odok.cz/attachment/-/down/VPRAA9L8ZY4W>

Radiation Accident³, approved by the Chairperson of SÚJB under ref. no. SÚJB/RO/17415/2018, sets out in its operational part the principles for dealing with the crisis situation arising as a result of RH.

3 <https://www.sujb.cz/dokumenty-a-publikace/typovy-plan-radiacni-havarie>

A.3.2.1. Sheltering

Sheltering in a building is the simplest, fastest and relatively effective protective action to reduce the impact of RaLs dispersed in the environment on human health. The effectiveness of sheltering increases with the quality of sealing of the building, staying on the lowest possible floors and using appropriate respiratory protection. The main goal for people is to be sheltered during the release and during the transit of the radioactive cloud, thus reducing internal exposure as a result

of RaL inhalation and external exposure from the radioactive cloud. Sheltering can reduce the dose that could be received by unprotected persons in the open air several times to an order of magnitude. At the same time, inhabitants must be encouraged not to consume food that has not been stored in packaging and in covered areas, and not to use water from uncovered sources. This prevents internal contamination from ingestion of RaL.

A.3.2.2. Iodine prophylaxis

The application of iodine prophylaxis is a specific protective action where presence of radioactive iodine in the air can be assumed. This situation occurs in the case of RH at NPP. The protective effect is based on the fact that the thyroid gland absorbs iodine very efficiently. After its saturation with stable iodine, no other iodine radioisotopes are received. Therefore, the population in ZHP is provided with potassium iodide tablets (hereinafter referred to as “KI”) in advance.

If stable iodine is used in sufficient time, ideally 2 to 4 hours before the body comes into contact with radioactive iodine, then the thyroid gland no longer absorbs these radioactive iodines, they

are gradually eliminated from the body and the person concerned is thus protected from relatively significant exposure from intake of this RaL. Therefore, iodine prophylaxis tablets (KI) are pre-distributed to the population in ZHP through the regional HZS in cooperation with regional authorities (to families, schools, hospitals and workplaces). For the needs of persons present within ZHP, the regional authority has created an additional 10% reserve of the total amount of KI distributed to ZHP. KI tablets and distribution are financially covered by the NPP operator. In addition, the population of the Czech Republic has the opportunity to buy these products in pharmacies.

A.3.2.3. Evacuation of persons from the area endangered by radiation accident or from the already affected and contaminated areas

Due to time constraints, it is rather unlikely that the evacuation could take place before the release of RaL from the crashed JZ, or before the arrival of the radioactive cloud. However, as this measure could basically lead to the population not being exposed to radiation at all, it is necessary to carefully consider this variant and analyse the real options in a given specific situation. The risk of such a procedure is that the release will occur at the time of evacuation and the inhabitants will become unprotected under the radioactive cloud. This may be even the case when the doses received by the population will be lower than if people remained sheltered for 48 hours in a

contaminated area. The announcement of evacuation depends on the course of the emergency sequence, the magnitude of release and the real radiation situation. However, it is much more likely that the evacuation will be carried out from a shelter and only after the real radiation situation has been evaluated on the basis of monitoring.

A.3.3. Protective actions for threat category A prepared within the ZHP

The management of RH occurred at NPP is largely set as to take some protective actions immediately after notification of its occurrence, based on the procedures described in the VHP, which is developed separately for ZHP of both NPPs in the Czech Republic described in Chapter A.1.

Sheltering and iodine prophylaxis are implemented within ZHP automatically after warning by sirens and transmission of pre-prepared radio and television sessions. Evacuation of people is performed depending on the development of RMU and the results of radiation monitoring.

Persons present in the inner part of ZHP (i.e. in the zone with a radius of 10 km from the Dukovany NPP, or in the zone with a radius of 5 km for the Temelín NPP) are requested to prepare for evacuation after warning and informing about the occurrence of RH through public media. Evacuation of persons takes place on the basis of the proposal of NPP operator, as specified or confirmed by SÚJB depending on the results of the MRS and real meteorological conditions (wind direction, weather category, precipitation, etc.). The governor will decide on the implementation of the evacuation, the mayors of the ORP, the mayors of the municipalities and the IZS units will ensure its implementation in accordance with the VHP.

The competent regional HZSs are responsible for developing the VHP. The VHP is developed in cooperation with the regional authorities, the Ministry of the Interior, the SÚJB, the NPP operator and the public authorities concerned that participate in the management of RH, and is finally approved by the governor of the region. In the case of the Dukovany NPP, where the Vysočina and Jihomoravský regions are concerned, the Vysočina Region is designated as the region coordinating its development. VHPs set out goals and methods for ensuring various types of protective actions, such as notifying authorities and organisations, warning the population, introducing urgent protective actions, including dosimetry control and decontamination at exits from endangered areas, regulating the movement of persons in endangered areas and providing necessary health care.

Other protective actions are prepared for ZHP in advance, such as the regulation of the movement of persons and vehicles within ZHP, decontamination, including dosimetry controls, regulation of the use of water, food and feed, measures to protect livestock and other subsequent protective actions including health care.

A.3.4. Potential protective actions for areas outside the ZHP

The above protective actions are being prepared for pre-defined ZHP, in which conditions are administratively created in advance to ensure fast and effective response to RH. Although the likelihood of the occurrence of RH at NPP with impacts requiring adoption of protective actions outside the established ZHP is very low, it is necessary to at least establish general procedures and strategies to deal with such a situation.

The real solution will depend on the evaluation of the specific radiation situation by KŠ SÚJB, based on estimates (forecasts from model dose calculations) or results of real measurements, which then show whether and to what extent it will be necessary to take protective actions in areas outside the established ZHP. The feasibility of measures outside the ZHP will then depend mainly on the extent of the affected area outside the ZHP - this can include several municipalities, a limited number of people, but it can also include hundreds or thousands of people in large settlements.

The instruction for sheltering people can be passed relatively quickly and effectively to the population concerned outside the ZHP through the public media or through the regional HZS and mayors of municipalities, even beyond the borders of individual regions. The proposal for the introduction of this measure, with the definition of the areas to which it would concern, shall be issued by SÚJB through the OPIS GR HZS, or ÚKŠ if it is already convened at the given time.

The transfer of information will be ensured by the governor in cooperation with the regional HZS. Inhabitants outside the ZHP are not prepared in advance for the introduction of protective actions, they must therefore be given very clear and instructive information on what to do and how to behave in shelter.

Iodine prophylaxis in areas outside the ZHP is not feasible due to the stated principles of distribution referred to in point A.3.2.2. At present, there is no larger stock of iodine tablets held in the Czech Republic, except for stocks required by the Atomic Act and intended for additional distribution in the given ZHP if necessary (10% reserve of the regional authority). In this case, sheltering measures will always be introduced with the sealing of homes and the recommendation for appropriate temporary respiratory protection. Consistent implementation of this measure can very effectively eliminate the dose contribution from radioactive iodine in the air.

In the case of an urgent protective action for evacuation, it cannot be realistically assumed that it would be necessary to evacuate people from significantly larger areas than the designated areas of the ZHP. Such a situation could affect a limited number of people under specific conditions. It can be assumed that in areas outside the ZHP it will be possible to ensure, through regime measures, that the doses of persons residing there do not exceed the set reference levels for evacuation. See point B for more details.

A.3.5. Protective actions for threat category D

The dispersion of RaL into the environment can also occur in another way and for another reason than the accident at JZ. These include, for example, the potential for an accident during the transport of RaL, the explosion of a so-called dirty bomb, the destruction of a stolen or orphan

source of ionising radiation and the subsequent dispersion of RaL over a large area, or intentional illegal misuse of a radionuclide source.

All these events are unlikely, but experience from abroad shows that they can occur, can have very serious impacts in terms of radiation protection and in most cases require a very rapid and effective response to prevent further spread of RaL and reduce impacts on people and the environment, including financial costs necessary to take remedial actions in the affected area.

In terms of the size of the area contaminated with such an RMU, it will be a rather local event (provided that the response is rapid and effective and there are no more centres of spread of RaL), but measures to protect the population will most likely need to be put in place. Whether a state of emergency will be declared or the situation could be managed declaring or not declaring a state of danger with appropriate crisis measures will depend on the specific radiation situation, the amount of dispersed RaL, the size of the contaminated area and the number of potentially endangered people.

These facts will also serve as a basis to decide what measures will be implemented to protect the health and lives of individuals. It can be assumed that such an event will be mainly associated with panic and great interest of the public and media. Exposure to persons would probably not be too high, with a few exceptions, however, the environment and infrastructure in the given area could be significantly disturbed and the recovery of the area after RH associated with decontamination could be technically difficult and time consuming. The psychological effects in these cases are likely to outweigh the serious health consequences after exposure.

A.3.6. Protective actions for threat category E

Protective actions for threat category E are associated with contamination of the territory of the Czech Republic due to RH in the territory of another state. MRS on the territory of the Czech Republic will indicate increased radiation levels. The protective actions to be taken into account would be the same as in the case of RH on the territory of the Czech Republic with impacts outside the ZHP. The most likely would be to introduce sheltering of the population and restriction of the

Residents will be immediately warned and informed about the situation and the measures to be taken through the regional HZS and the mayor of the municipality. Should RH take place in a residential area, adequate urgent protective actions would have to be put in place for the population to prevent exposure. In the affected area, the competent state authorities and crisis management bodies will adopt the regime measures proposed by SÚJB. Food, drinking water and feed contaminated with RaL will be inedible and safely disposed of. Industrial products and goods will be decontaminated and, if their level of contamination cannot be reduced below the maximum permitted levels, they will be disposed of.

Details of the procedures for the intervention of the IZS in the event of dispersion of RaL through an explosion are described in the Type Activity "Dirty Bomb" (STČ 01/IZS).¹

1 <http://www.hzscr.cz/soubor/stc01-izs-spinava-bomba-2015-fin-pdf>

use of local food and agricultural products. Other regime measures may be proposed by SÚJB for the affected area.

The specific competencies of ÚSÚ, some of the line organisations concerned and regional and local self-government authorities related to the provision of measures and procedures in the above cases are set out in point A.5.

A.3.7. Radiation situation monitoring system

The content of point A.3.1 shows that knowledge of the real radiation situation in the area concerned, which is characterised by dose rate, surface activity of contaminated terrain or activity concentration in the air and knowledge of the composition of released radionuclides, is absolutely essential for correct and effective decision-making on procedures and protective actions in a given situation.

The provision of MRS, the legal framework of which is defined by the Atomic Act and Decree No. 360/2016 Coll., on radiation situation monitoring, forms an essential part of response preparedness for RH in the Czech Republic.

The SVZ is the backbone system of MRS, which serves to quickly detect deviations from the normal radiation situation, whether they are or are not caused by RMU within or outside the Czech Republic. The measuring points of the SVZ are equipped with dose rate detectors with continuous recording and data transmission to the MonRaS system. The SVZ includes teledosimetry systems located in the vicinity of both Czech NPPs. Ten measuring points of the SVZ are at the same time the measuring points of air contamination, where large volumes of air are continuously taken and RaL are captured on the filter. Sensitive filter measurements then allow the presence of even trace amounts of RaL in the air to be determined. MRS also has mobile ground and air monitoring groups. It also includes a network of laboratories ready to measure environmental samples taken in the affected area.

The functioning of the MRS is described in detail in the National Monitoring Program approved by the Chairperson of the State Office for Nuclear Safety in Prague on 11 December 2018 under ref. no.: 23533/2018 and published at <https://www.sujb.cz/dokumenty-a-publikace/narodni-program-monitorovani/>

The monitoring results are published through the MonRaS system on the SÚJB website: <https://www.sujb.cz/monitorovani-radiacni-situace/>

A.4. Overview of administration authorities

that participate in the system for dealing with radiation accidents, if emergency is declared by the Government of the Czech Republic, including their communication data

State Office for Nuclear Safety

Senovážné náměstí 9, 110 00 Praha 1
Phone: 221 624 111
Fax: 222 220 917
E-mail: podatelna@sujb.cz
Data box ID: me7aazb
www.sujb.cz

Ministry of Interior

Nad Štolou 3, 170 34 Praha 7
Phone: 974 811 111
Fax: 974 833 582
E-mail: posta@mvcz.cz
Data box ID: 6bnaawp
www.mvcz.cz

Ministry of Defense

Tychonova 221/1, 160 00 Praha 6
Phone: 973 201 111
E-mail: e-podatelnaMO@army.cz
Data box ID: hjyaavk
www.army.cz

Ministry of Health

Palackého nám. 4, 128 01 Praha 2
Phone: 224 971 111
Fax: 224 972 111
E-mail: mzcr@mzcr.cz
Data box ID: pv8aaxd
www.mzcr.cz

Ministry of Agriculture

Těšnov 65/17, 110 00 Praha 1
Phone: 221 811 111
Fax: 224 810 478
E-mail: posta@mze.cz
Data box ID: yphaax8
www.mze.cz

Ministry of Industry and Trade

Na Františku 32, 110 15 Praha 1 - Staré Město
Phone: +420 224 851 111
Fax: +420 224 811 089
E-mail: posta@mpo.cz
Data box ID: bxtaaw4
www.mpo.cz

Ministry of Regional Development

Staroměstské náměstí 6
110 15 Praha 1
Phone: +420 224 861 111
Fax: +420 224 861 333
E-mail: posta@mmer.cz
Data box ID: 26iaava
www.mmer.cz

Ministry of Foreign Affairs

Černínský palác, Loretánské nám. 101/5
118 00 Praha 1 - Hradčany
Phone: 224 182 425 (OIC MZV)
Fax: 224 182 047
E-mail: epodatelna@mzv.cz
Data box ID: 6c3ew5w
www.mzv.cz

Ministry of Finance

Letenská 15, 118 10 Praha 1
Phone: 420 257 041 111
Fax: 420 257 042 788
E-mail: podatelna@mfcz.cz
Data box ID: xzeaauv
www.mfcz.cz

Ministry of the Environment

Vršovická 1442/65, 100 10 Praha 10
Phone: 267 121 111
Fax: 267 310 308
E-mail: info@mzpcz.cz
Data box ID: 9gsaax4
www.mzpcz.cz

Administration of State Material Reserves

Šeříková 616/1, 150 85 Praha 5 - Malá Strana
Phone: +420 222 806 111
Fax: +420 251 510 314
Data box ID: 4iqaa3x
www.sshr.cz

Ministry of Transport

nábřeží Ludvíka Svobody 1222/12
110 15 Praha 1
Phone: +420 225 131 111
E-mail: posta@mdcr.cz
Data box ID: n75aau3
www.mdcr.cz

Ministry of Education, Youth and Sports

Karmelitská 529/5, 118 12 Praha 1
Phone: +420 234 811 111
E-mail: posta@msmt.cz
Data box ID: vidaawt
www.msmt.cz

A.5. List of competencies of the bodies referred to in point A.4

and description of their tasks within the management of radiation accident under point A.3

This point contains a list of competencies of ÚSÚ, their line organisations concerned and regional and local self-government authorities in drawing up recommendations and implementing urgent protective actions outside the established ZHP in case of RH, if a state of emergency is declared by the Government of the Czech Republic or the Prime Minister. In the case of threat category A, the protective actions implemented in the ZHP according to the developed VHP and subsequently, on the basis of forecasts or evaluation of radiation situation monitoring, are extended beyond the specified ZHP, where required by the situation. Therefore, these competencies potentially apply to the entire territory of the Czech Republic, including ZHP.

Following the declaration of a state of emergency by a government resolution, the ministries and other ÚSÚ follow their crisis plans in order to meet the requirements for ensuring protective actions for the population in accordance with the strategy set out by the NRHP. The Government shall immediately inform the Chamber of Deputies of the declaration of a state of emergency. The

Prime Minister shall activate the ÚKŠ, the composition and activities of which are set out in the Statute of the Central Crisis Staff¹, which is approved by the Government. The Statute stipulates that the ÚKŠ is a working body of the Government for dealing with crisis situations and is included in the system of bodies of the National Security Council.

The meetings of the ÚKŠ sets out which ÚSÚ and to what extent it will participate in the practical implementation of the announced protective actions. The following points A.5.1 to A.5.15 list the basic competencies of individual ministries and the organisations controlled by them as set out by relevant legislation in the implementation of protective actions and the implementation of remedial measures after a radiation accident. In some areas, competencies may overlap and the needs not identified in advance may arise depending on the current situation. Such situations will have to be dealt with on an ad-hoc basis at the meetings of the ÚKŠ, which will meet regularly throughout the declaration of a state of emergency.

¹ The Statute of the Central Crisis Staff was adopted by Government Resolution No. 1500 of 24 November 2008 and amended by Government Resolution No. 43 of 13 January 2020, and the new Statute was adopted on 15 March 2020 by Government Resolution No. 213

A.5.1. State Office for Nuclear Safety

After receiving the notification of the occurrence of RH, or on the basis of its own evaluation that the situation in the Czech Republic is RH, SÚJB shall activate its KŠ and the head of KŠ SÚJB shall inform the Prime Minister and the Office of the Government of the Czech Republic about the occurrence of RH and shall propose the activation of ÚKŠ and the declaration of a state of emergency in the contaminated area.

In its work in response to the RH, SÚJB uses the support of the National Radiation Protection Institute and the National Institute for Nuclear, Chemical and Biological Protection. SÚJB, on the basis of the information received and in accordance with the Atomic Act, Decree No. 422/2016 Coll., on radiation protection and security of a radioactive source, Decree No. 360/2016 Coll., on radiation situation monitoring, Decree No. 359/2016 Coll., on details of ensuring radiation extraordinary event management and crisis law, shall

- a) initiate and control radiation situation monitoring and determine, in accordance with § 149 (2) of the Atomic Act, the scope and manner of involvement of individuals in emergency monitoring,
- b) continuously evaluate data and technological data on the state of JZ from the point of view of forecasting the further development of radiation situation, when RH occurs at JZ on the territory of the Czech Republic,
- c) issue a proposal for the introduction of protective actions, their specification or withdrawal, anywhere in the Czech Republic,
- d) confirm or specify the proposal for the introduction of urgent protective actions issued by the JZ operator in the case of RH at JZ,
- e) continuously inform ÚKŠ about the scope, course and expected consequences of RH on the territory of the Czech Republic,
- f) at the request of other administrative authorities, provide professional assistance, ensure the performance of professional work under its competence and provide the necessary documents,
- g) regularly evaluate the data obtained from radiation situation monitoring and the measures taken, and on the basis of these results, provide the basis for making decision on further measures to reduce or prevent exposure,
- h) closely cooperate with the emergency staff of the operator (in the case of RH at NPP), with the KŠ of MV-GR HZS ČR, KŠ and HZS of the affected region,
- i) provide preliminary information to the general population in case of RH about the protective actions and steps to be taken to ensure radiation protection; such information is regularly updated,
- j) ensure information of the general public about the occurrence and the course of a radiation accident which has an impact on the territory of the Czech Republic outside an emergency planning zone and about the steps and measures to be taken during the various stages of development of the radiation accident, unless this information is being provided by another state authority,
- k) ensure that the competent regulatory authorities of neighbouring states are notified of the occurrence and the course of RH which occurred on the territory of the Czech Republic and about the steps and measures to be taken,
- l) provide information about the adoption of measures to protect the general public in the Czech Republic in the event of a RH occurred on the territory of Member States of the Euratom to the European Commission and other Member States of the Euratom which may be affected by these measures and, in accordance with the Czech Republic's international commitments, provide public access to information thus obtained,
- m) ensure notification of regional authorities about the occurrence and the course of RH outside the territory of the Czech Republic and about the steps and measures to be taken in the course of RMU,
- n) participate, in cooperation with the Ministry for Regional Development (hereinafter referred to as "MMR") and the Ministry of Finance, in the preparation of the draft strategy for recovery of the area, in particular by proposing the definition of the

contaminated area to remedy the situation after RH based on the assessment of monitoring results,

- o) set out, in cooperation with the Ministry of Health, the Ministry of Agriculture or the Ministry of the Environment, in the form of general measures or remedial measures, the necessary measures to regulate exposure in the existing exposure situation

resulting from RH, including regulation or prohibition of the use of water and food from local sources.

- p) on the basis of the evaluated situation in the affected area and taking into account the set maximum permitted levels of radioactive contamination of food and feed, provide, in cooperation with the MZe, technical assistance to the regulatory authorities of the MZe.

A.5.2. Ministry of Interior

- a) provides the SIC service of the MV,
- b) convenes and coordinates the activities of ÚKŠ,

- c) ensures the preparation of decisions for the declaration of a state of emergency

A.5.2.1. Fire Rescue Service of the Czech Republic

- a) provides warning and information to the population and notification of IZS units and crisis management bodies,
- b) participates in radiation situation monitoring,
- c) performs radiation survey and demarcation of protection zones,
- d) provides, within the scope of its competence, preliminary information to the population concerned about the measures to protect the general public, which apply to the general public and about the steps to be taken in the case of such situation,
- e) cooperates with the governor of the region and the municipal office of the municipality with extended competence (hereinafter referred to as "ORP") in informing the general population, if it is RH,
- f) keeps records of data on temporary changes of residence of people,
- g) ensures and coordinates the implementation of rescue and remedial work, performs the tasks set by the Ministry of the Interior of the Czech Republic,
- h) at the points of decontamination, sorts people and equipment by the level of surface contamination, performs subsequently their decontamination, or ensures additional protective actions,

- i) organises and coordinates evacuation, emergency accommodation, emergency supply of drinking water, food and other necessary resources for survival of the population and humanitarian aid,
- j) organises communication between the components involved in rescue and remedial work,
- k) ensures monitoring and recording of doses received by members of the Fire Rescue Service of the Czech Republic, or other persons,
- l) through the General Directorate of the Fire Rescue Service of the Czech Republic, ensures the central coordination of rescue and remedial work, including:
 - measures in favour of rescue and remedial work at the level of the Ministry of the Interior of the Czech Republic, other ministries and the ÚSÚ,
 - recording and monitoring of the effectiveness of the deployment of forces and resources in rescue and remedial work.

The Operational and Information Centre (hereinafter referred to as "OPIS") of the regional HZS

- a) receives and verifies notification of the occurrence and course of RMU,
- b) informs the OPIS MV-GŘ HZS ČR about the occurrence of RMU,
- c) declares the appropriate alarm level,
- d) mediates the organisation of the tasks assigned by the intervention commander,
- e) notifies the governor, the mayors of the ORP, the emergency IZS units and the mayors of the affected municipalities, the authorities concerned, the control officers of the regional HZS and the director of the regional HZS,
- f) warns the population by activating sirens in the endangered area,
- g) ensures the broadcasting of warning programs on Czech Television and Czech Radio in the event of RH at NPP,
- h) at the instruction of the governor, convenes the KŠ of the region,
- i) at the instruction of the mayor, convenes the KŠ of ORP,
- j) informs the ČHMÚ about the occurrence of RH and requires information from the ČHMÚ about the meteorological situation and weather forecast,
- k) ensures the end of broadcasting of warning programs on Czech Television and Czech Radio in the event of RH at NPP,
- l) provides activities according to the alarm plan,
- m) forwards reports on the course of rescue and remedial works to the Ministry of the Interior of the Czech Republic (ÚKŠ) through OPIS MV-GŘ HZS ČR,
- n) performs the tasks assigned by the authorities authorised to coordinate rescue and remedial work (intervention commander, governor, Ministry of the Interior of the Czech Republic),
- o) calls and deploys the necessary forces and resources of HZS,
- p) requires and organises planned on-demand assistance and personal and material assistance as required by the intervention commander.

- a) receives information about the occurrence and course of a radiation extraordinary event,
- b) notifies the common operational centre of the Ministry of Defence, contact point (hereinafter referred to as "SM") SÚJB (KŠ SÚJB), situational information centre of the MV, information and operational centre of the Police Presidium of the Czech Republic, ČHMÚ and OPIS of the regional HZS, the Secretariat of the National Security Council and the Office of the Government of the occurrence of RH through SIC of the MV,
- c) informs the executive staff of MV-GŘ HZS ČR about the occurrence of RMU,
- d) acts as a national warning point and SM for receiving information about RH abroad - IAEA and European Commission (WebECURIE),
- e) informs neighbouring states about the occurrence of RH on the territory of the Czech Republic,
- f) participates in ensuring the central coordination of rescue and remedial works and organises communication between the Ministry of the Interior of the Czech Republic and the affected area during rescue and remedial works.

A.5.2.2. Police of the Czech Republic

- a) participates in radiation situation monitoring,
- b) performs closures at specified places,
- c) ensures regulation of the movement of people and vehicles,
- d) ensures public order and security in the affected areas,
- e) ensures the protection of property,
- f) with dedicated forces and resources of the AČR, ensures regulation of the movement of people and the protection of property (guard services),
- g) performs tasks according to the decision of the competent crisis management authorities.

A.5.3. Ministry of Defence - Armed Forces of the Czech Republic

- a) through the OPIS MV-GŘ HZS ČR, makes decisions of crisis management bodies on the use of forces and resources,
- b) participates in radiation situation monitoring,
- c) performs tasks on the basis of a government regulation or the Agreement on Planned On Demand Assistance between the MV-GŘ HZS ČR and the Ministry of Defence - General Staff of the Armed Forces of the Czech Republic or the General Agreement on the Activities of the National Radiation Monitoring Network under the MO,
- d) ensures the establishment of decontamination points and the decontamination of emergency forces and resources, natural persons and, if necessary, provides assistance in decontamination of animals on the basis of the instructions of SVS or IZS units,
- e) based on the decision of the Government, they allocate forces and resources for the performance of the tasks of the Police of the Czech Republic.

A.5.4. Ministry of Health

- a) develops the system of special medical care provided by selected clinics to physical persons irradiated during RMU,
- b) designates the providers of health services for the provision of care to natural persons exposed in a radiation extraordinary event and makes public a list of these providers in the Bulletin of the Ministry of Health in a manner enabling remote access,
- c) methodically controls cooperation between the providers of emergency medical services and the components of the integrated rescue system and crisis management in accordance with the Act on the Integrated Rescue System and the Act on Crisis Management,
- d) at the request of the region, coordinates the activities of the provider of emergency medical services and the provider of medical transport services and the transport of urgent care patients, if the extraordinary event extends beyond the territory of the region which designated the provider of emergency medical services, or if it is necessary for technical or capacity reasons, and if the regions do not agree on dealing with the situation
 - emergency medical service¹, which is a basic component of the IZS providing mainly pre-hospital urgent care at the place of severe effects on health or direct threat to life and during transport to the target provider of acute inpatient care, in cases of RMU provides health care at the points of decontamination of people²,
- e) during crisis, at the request of the region, coordinates the activities of the providers of emergency medical services and the providers of acute inpatient care who have established an urgent reception or the status of a specialized centre, in the provision of urgent care,
- f) through regional hygiene stations and in cooperation with SÚJB, ensures:
 1. hygiene and epidemiological investigations and measures, including determination of hygiene requirements for the health safety and purity of drinking water,
 2. measures to protect public health in the production of food, in putting into circulation food or in direct contact with food and meals,
 3. restrictions of the production, suspension of sales and prohibition of the use of water, food and other products suspected of contamination,
 4. for the time necessary to carry out state health supervision, prohibiting the use of a substance, raw material, semi-finished product or food intended for the production or preparation of meal,
- g) orders extraordinary measures to protect the health of natural persons in the event of low-quality or violations of the quality of suspicious waters, when they are to be implemented nationwide or in the areas of several regions, and decides on their termination, including placing of products on the market or putting into circulation,
- h) in the exercise of state health supervision, public health protection authorities may, within the scope of their competence, prohibit or restrict the use of low-quality drinking water.

The tasks of public health protection in the field of state administration in the protection and promotion of public health, including state health supervision, are also performed by:

- MO in the armed forces and in the organisational units of the state established within its competence and public-benefit organisations and the facilities used by them³,
- MV in the security forces, with the exception of the Prison Service of the Czech Republic, and in the organisational units of the state as well as public-benefit organisations established within its competence, including buildings and facilities used by them and established by MV⁴.

In state health supervision and in acts for the protection of public health, it cooperates with other control bodies, especially with SVS, SZPI and ČOI.

1 <https://zachrannasluzba.cz/system-zzs-v-cr/>

2 Act No. 374/2011 Coll., on Emergency Medical Services

3 § 78 and 83 of Act No. 258/2000 Coll., on Protection of Public Health

4 § 78 and 83 of Act No. 258/2000 Coll., on Protection of Public Health

A.5.5. Ministry of Transport

- a) performs tasks to deal with RH according to the decision of the Government or ÚKŠ,
- b) according to the extent of RH, on the basis of a request from the Government or ÚKŠ, sets out instructions or takes measures to completely stop or restrict traffic in the affected area for road, rail, water and air transport, including restrictions for the appropriate transport infrastructure,
- c) according to the extent of RH, restricts or completely stops the provision of public services in the segment of long-distance rail transport operated under the concluded contracts by individual contractual carriers of the Ministry of Transport,
- d) at the time of the declaration of a state of emergency, the Ministry of Transport is entitled to exceptionally impose obligations to cover transport needs in accordance with § 12 of the Crisis Act, as amended, on the operator of railway, rail transport, road transport, aircraft, airports, inland waterway transport and public ports, as well as the owner and operator of other facilities, equipment and transport routes serving transport.

A.5.6. Ministry of Finance

- a) after discussion with the Ministry of the Interior, proposes in the budget chapter of the General Treasury Management a special-purpose reserve of funds for dealing with crisis situations and eliminating their consequences, and sets out rules and procedures for using such funds,
- b) in cooperation with the Ministry of Regional Development (hereinafter referred to as “MMR”) and SÚJB, participates in development of a strategy for the recovery of the area after RH and provides the necessary funding to the competent public authorities to ensure the implementation of measures to eliminate the consequences of RH,
- c) manages the nuclear account.

A.5.6.1. Bodies of the Customs Administration of the Czech Republic

- a) participate in radiation situation monitoring,
- b) as another component of the IZS, perform the tasks of the competent crisis management bodies.

A.5.7. Ministry of the Environment

- a) participates in radiation situation monitoring and carries out monitoring at monitoring points, including monitoring of meteorological situation, forecasts of its development and the way of spreading of the released radionuclides in emergency monitoring, and ensures the operation of the testing laboratory (ČHMÚ, VÚV),

- b) perform tasks of the competent crisis management authorities,
- c) ensures the implementation of continuous control of water quality in cooperation with the hygiene station,

- d) provides an alternative supply of drinking water (in cooperation with the authorities responsible for agriculture).

A.5.8. Ministry of Agriculture

- a) participates in radiation situation monitoring and ensures the operation of the testing laboratory,
- b) performs tasks of the competent crisis management authorities,
- c) ensures the regulation of feed and food production through the State Veterinary Administration of the Czech Republic, the Agricultural and Food Inspection Authority and the Central Agricultural Inspection and Testing Institute,

- d) in cooperation with the Ministry of the Environment, ensures the supply of drinking water, the control bodies of the Ministry of Agriculture, on the basis of the general measure issued by SÚJB, order restrictions or prohibitions of food production, restrictions in putting into circulation food; suspension of sales and prohibition of the use of food, feed and meals suspected of contamination, prohibit the use of raw materials, semi-finished products or food intended for the production or preparation of meal.

A.5.8.1. Agricultural and Food Inspection Authority

- a) participates in radiation situation monitoring,
- b) takes measures to prohibit the production and/or placing on the market of dangerous agricultural products or food,
- c) takes measures to suspend the placing on the market of agricultural products or food where a hazard is suspected,

- d) issues orders to destroy hazardous agricultural products or food,
- e) imposes, in the case of RH, the necessary measures in handling and distribution of food and feed in the form of general measures (hereinafter referred to as "OOP").

A.5.8.2. State Veterinary Administration

- a) through the State Veterinary Institute (hereinafter referred to as “SVÚ”) participates in radiation situation monitoring,
- b) participates in the remedy of the area after RH,
- c) through the regional veterinary administrations, the State Veterinary Administration (hereinafter referred to as the “SVS”) orders extraordinary veterinary measures in relocation of animals, production of animal feed and products,
- d) takes measures for the survival of livestock and the method of securing them (emergency feeding, water supply, protection of water resources and feed),
- e) establishes routes for the relocation of animals to non-contaminated areas, including stabling and the designation of sites for decontamination of transported animals,
- f) decides on the handling of food of animal origin that does not meet the requirements for the maximum permitted radioactive contamination,
- g) performs the sorting of livestock in terms of contamination for their further commercial use, or their disposal in predetermined burial grounds.

A.5.9. Ministry of Industry and Trade

- a) develops the concept of radioactive waste management (hereinafter referred to as “RAW”),
- b) in cooperation with the Radioactive Waste Repository Authority, lays down the procedures for finding suitable sites and premises for temporary storage of contaminated material as a result of RH, procedures for its sorting and final disposal,
- c) performs other tasks of the competent crisis management authorities,
- d) through the Czech Trade Inspection Authority, in the event of RH, issues the following measures for products falling within its supervisory competence:
 - prohibits the placing on the market, distribution or use of contaminated products,
 - orders the withdrawal of contaminated products from the market or circulation,
 - orders the disposal of contaminated products.

A.5.10. Ministry of Regional Development

- a) pursuant to § 4 (3) of Act No. 12/2002 Coll., on State Aid to Recover Areas Affected by Natural or Other Disaster, submits to the Government a draft strategy for the recovery of the affected area drawn up in cooperation with the Ministry of Finance for approval.
- In the case of RH, SÚJB also participates in drawing up the strategy for the recovery of the area,
- b) ensures the conditions for long-term accommodation of evacuees,
- c) manages the funds intended for ensuring housing policy.

A.5.11. Ministry of Foreign Affairs

- a) on the basis of information from SÚJB, immediately informs the representative offices of neighbouring states accredited in the Czech Republic and the representative offices of the Czech Republic in neighbouring countries about the occurrence and extent of

RH and keeps them informed about the course of radiation situation based on the evaluation of MRS results by SÚJB.

A.5.12. Ministry of Education, Youth and Sports

- a) designated educational institutions ensure continuous operation after the declaration of a state of emergency, when the care of pupils cannot be performed by legal representatives in crisis situation; the crisis management authorities may, as part of crisis measures and in agreement with the directors of educational institutions, impose on natural persons an obligation or work assistance in relation to the competent educational institutions. After the declaration of a state of emergency, competent employees can be ordered the on-call duty.
- b) designated educational institutions provide the necessary care for pupils outside the educational activity, in particular

1. accommodations,
2. meals,
3. first aid, psychological and health care in cooperation with the competent professional bodies and facilities,
4. support given to pupils in finding their legal representatives and in dealing with other needs caused by crisis situation,
5. permanently updated records of accommodated persons.

A.5.13. Administration of State Material Reserves

- a) ensures the financing of economic measures for crisis situations and the financing, replacement, exchange, loan, release, lease, sale, storage, protection and control of state material reserves and, in accordance with the requirements of crisis plans, their acquisition,

- b) performs tasks of the competent crisis management authorities,
- c) releases stocks from state material reserves (hereinafter referred to as "SHR") for the purpose of carrying out intervention and remedial work and for the needs of the population.

A.5.14. Other bodies, units and organisations (designated by the Government, central authorities, governor of the region, mayor of the municipality)

- a) receive notifications of the situation,

- b) ensure the readiness of their own forces and resources,

c) ensure protective actions,

d) take measures within their competence.

A.5.15. Bodies of regional and local authorities

A.5.15.1. Regional authority

a) ensures the fulfilment of tasks assigned by the governor of the region.

A.5.15.2. Governor of the region

- a) receives and verifies notification of the occurrence of RH,
- b) establishes the KŠ of the region as his/her working body,
- c) proposes the Prime Minister to declare a state of emergency,
- d) during the state of emergency and threat to the state, ensures the implementation of specified crisis measures in the conditions of the region,
- e) in the case of RH occurred on the territory of the region within the scope of its competence stipulated by legislation, informs immediately the population affected by this RMU about:
 - 1. the facts of RH,
 - 2. the steps to be taken, and
 - 3. the measures to protect the population to be taken, if necessary,
- f) cooperates with the Fire Rescue Service of the Czech Republic and the municipal authority of ORP in providing information under letter e),
- g) ensures cooperation with the mayors of ORPs, possibly with the governor of the neighbouring region in ZHP,
- h) coordinates rescue and remedial work at the regional level, provision of health care, implementation of measures to protect public health and to provide immediate funeral services,
- i) coordinates emergency accommodation, emergency supply of drinking water, food and other necessary resources for survival of the population,
- j) provides information to the mass media,
- k) keeps documentation on the course of the extraordinary event and forwards reports to the Ministry of the Interior of the Czech Republic through the OPIS HZS of the region,
- l) gives instructions to terminate the broadcasting of warning programs on Czech Television and Czech Radio in the event of RH at NPP,
- m) provides care for children and young people, if this care cannot be provided by parents or another legal representative in crisis situation.

A.5.15.3. Mayor of the municipality with extended competence

- a) in the case of RH with an impact on the territory of the municipality within the scope of its competence, informs immediately the population affected by this RMU about
 1. the facts of RH,
 2. the steps to be taken, and
 3. the measures to protect the population to be taken, if necessary,
- b) forwards instructions for the behaviour of the population in the administrative area of the municipality,
- c) organises the evacuation and activities of the municipality in the conditions of emergency survival of the inhabitants of the municipality,
- d) performs the tasks set out by the mayor of the ORP and the crisis management authorities in dealing with the crisis situation through cooperation with the KŠ of the municipality with extended competence,
- e) ensures the fulfilment of tasks according to the instructions of the mayor of the ORP or the governor,
- f) keeps documentation on the course of the extraordinary event and forwards reports to KŠ of the ORP.

A.5.15.4. Mayor of the municipality

- a) kontroluje průnik signálu sirén na území obce, v případě výpadku varuje obyvatelstvo ručním spuštěním sirén, popřípadě náhradním způsobem,
- b) controls the receipt of siren signal on the territory of the municipality, in the event of failure, warns the population by manually triggering the sirens, or in an alternative way,
- c) forwards instructions for the behaviour of the population in the administrative area of the municipality,
- d) organises the evacuation and activities of the municipality in the conditions of emergency survival of the inhabitants of the municipality,
- e) performs the tasks set out by the mayor of the ORP and the crisis management authorities in dealing with the crisis situation through cooperation with the KŠ of the municipality with extended competence,
- f) ensures the fulfilment of tasks according to the instructions of the mayor of the ORP or the governor,
- g) keeps documentation on the course of the extraordinary event and forwards reports to KŠ of the ORP.

B. FOLLOW-UP PROTECTIVE ACTIONS

TO AVERT OR MITIGATE THE IMPACTS OF RADIATION ACCIDENT

Each RMU, thus also RH, has its own time course and phases, which can be characterised to some extent by various parameters, but preferably by activities that are provided in a given phase by the RMU response system. It is obvious that the individual phases will gradually transit from one to another and overlap in certain time periods, as schematically indicated in Figure 1.

The occurrence of RMU results in the transition of planned exposure situation (hereinafter referred to as "PES") to NES. The resulting NES presented in Figure 1 for the case of RH at NPP has two time phases - accident phase and post-accident phase of RMU. In terms of the introduction of urgent protective actions for the population, the accident phase can be divided into a period of the threat of radioactive release within which the population can be evacuated before release under certain conditions, and a period of radioactive release, when it is typically necessary to introduce urgent protective actions of sheltering and iodine prophylaxis.

In the post-accident phase, in the so-called transitional phase, activities aimed at specifying, modifying or, conversely, withdrawing the introduced urgent protective actions are provided and a decision is made on the potential introduction of follow-up protective actions. At the same time, measures (specified in more detail in point B.2.) are already being implemented, aimed in particular at recovering the functions of critical infrastructure. In the transitional phase of RH, the first measures associated with the remedy after RH are already being implemented, i.e. reducing the later consequences of RH in terms of eliminating the exposure of the population to radioactive material deposited in the affected area.

In the transitional phase of NES, activities, the completion of which is a symptom for the termination of NES and for the transition from NES to EES or PES, are particularly implemented. The basic activities in this period are: detailed emergency MRS of the contaminated area and gradual withdrawal of the announced urgent protective actions and other measures to protect the population.

The accident phase gradually transits to the period of remedy after RH, when the strategy for the recovery of the area after RH is implemented in order to ensure the return of life of the population in the affected area to the state before RH or at least to the state where evacuees will be able to return to their homes and, under the established regime measures, their doses caused by environmental contamination will be lower than the set reference levels. This will be achieved through the gradually introduced follow-up protective actions and, in particular, the decontamination of buildings and the environment where possible, effective and efficient. All protective actions put in place must be justified and optimised.

In some situations, it may be assessed on the basis of analyses that it is better not to take measures from the point of view of radiation protection. The effectiveness and feasibility of individual measures will depend on many factors - season (and thus the growing season) and the current weather in which RH occurs, the amount of dispersed RaL, the size of the affected area, the number of persons concerned, the severity of disturbance of basic functions, etc.

Detailed knowledge of the radiation situation in the contaminated area will be essential information for making decisions on the implementation of follow-up protective actions. Based on the results of the emergency MRS, zones with restrictions of the movement of persons will be defined and appropriate regime measures will be set for the stay in the area where it will be possible.

The benefits and costs of specific measures will be assessed and it will be necessary to consider whether the return of the population to the contaminated area with a regime measure which ultimately means a significant and long-term restriction of outdoor movement really means a pure social benefit in the given situation. At the same time, the non-radiation health effects caused by the introduction of individual forms of follow-up protective actions must be assessed.

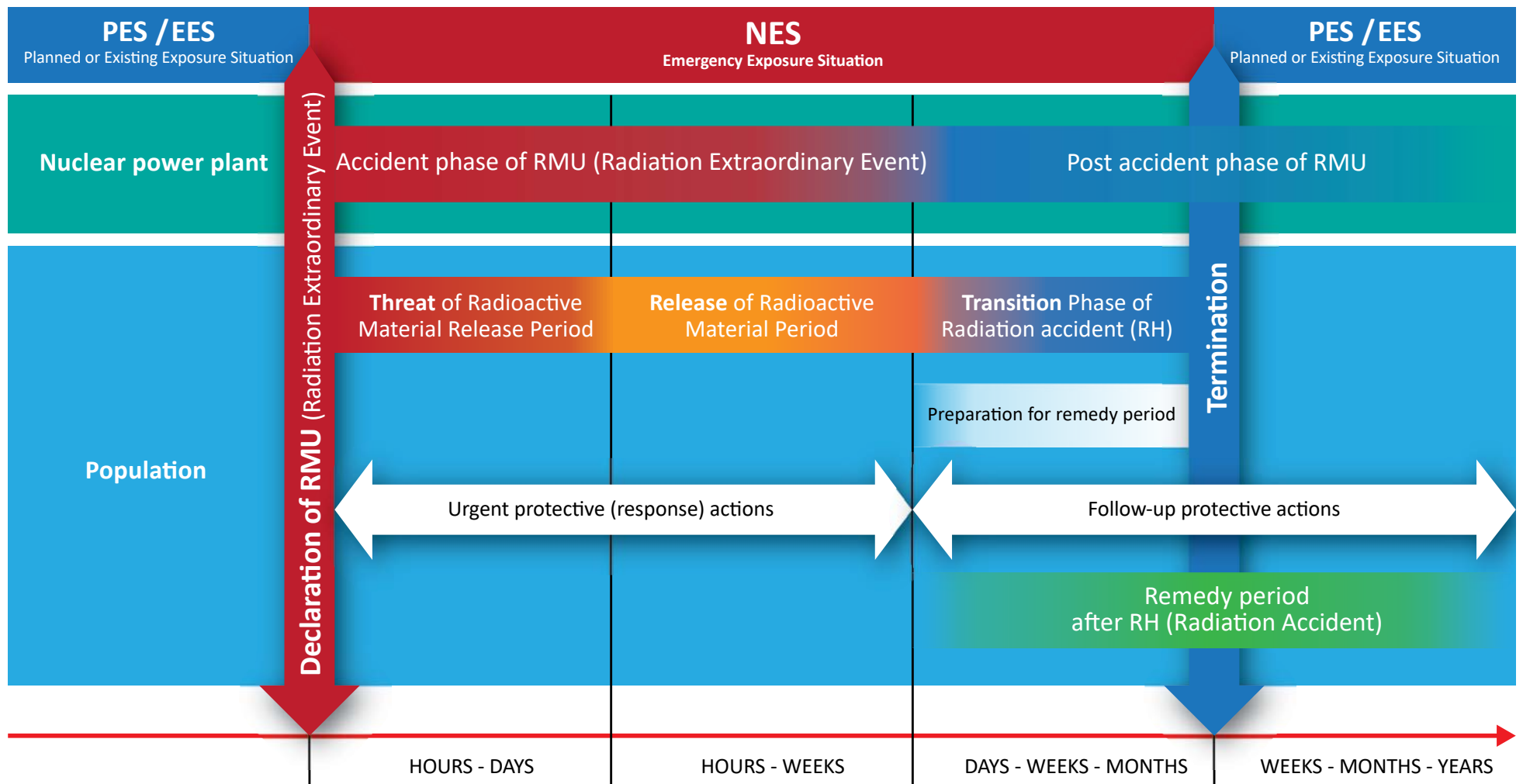


Figure 1: Schematic representation of the time phasing of RH in terms of its course at NPP, the introduction of urgent and follow-up protective actions for the population and the initiation of remedy after RH

The administration of the contaminated area, the contamination of which is the result of NES is driven by the strategy for optimised radiation protection

B.1. Strategy for optimised radiation protection

for the administration of the contaminated area, the contamination of which is the result of NES

The objective of the strategy for optimised radiation protection is to create such conditions for the stay of persons in the contaminated area to ensure that the set reference levels for the competent representative person are not exceeded. Radiation protection measures set out within the given strategy are continuously optimised in accordance with the results of MRS and the required objectives.

The strategy for optimised radiation protection for the administration of the contaminated area includes the following basic activities

1. collecting all available information on

- a) the level of radioactive contamination using a detailed MRS in order to identify the radionuclide composition and concentrations (surface, specific activities and activity concentration) of RaL in individual components of the environment and food chain, specification of dose rate values in the affected area and location of spots with increased level of contamination (hot spots),
- b) the ways of using the contaminated area, whether and how it is inhabited, or recreational areas, important industrial areas, whether agricultural products are produced in the given area, whether specific services are provided there,
- c) the population residing in the contaminated area, in particular demographic information.

2. assessment of radiation and non-radiation impacts

- a) assessment of potential health impacts on a representative person during stay in the contaminated area using data from MRS stored in the MonRaS and assessment models.

The aim is to identify the most serious exposure routes and to calculate effective doses per representative person present in the contaminated area,

- b) setting out maximum permitted levels of radioactive contamination,
- c) definition of contaminated areas by contamination level (danger zone, restricted access zone and controlled stay zone),
- d) assessment of non-radiation impacts on the psyche of people and provision of their health care.

3. setting the objectives and the options to achieve them

- a) ensuring the regulation of persistent exposure by setting out reference levels defining the areas with different levels of contamination and introducing control of entry into the danger zone and the restricted access zone,
- b) regulating the consumption of potentially contaminated products by restricting production, suspending sales and prohibiting the use of unprotected drinking water, food and other products suspected of contamination,
- c) the possibility of resuming economic and business activities in the contaminated area by assessing the necessity and effectiveness in comparison with the costs of their activation,
- d) minimizing the amount of waste generated in the decontamination process by assessing the procedures used and introducing measures for the sorting and safe disposal of waste.

4. assessment of the alternatives for achieving the set objectives taking into account optimisation of radiation protection¹ to control the persistent exposure in the administration of the contaminated area

- a) assessment of the definition and spread of contaminated areas by contamination level,
- b) setting out current reference levels for radiation control,
- c) the need (method and extent) for restricting the movement and stay of persons, determining the number of persons affected by the measure,
- d) assessment of the established conditions and criteria for agricultural production, consumption of local production, including drinking water, for decontamination of the contaminated area and storage and treatment of contaminated waste,
- e) assessment of the possibilities and ways of ensuring the functioning of the basic infrastructure in the affected areas, including provision of health care, if the return of people to these areas will be allowed.

5. implementation of the decision

- a) at the local level, the management of remedial activities during the transition period moves from crisis management regime to regime where the decision on the action taken is also based on discussion and consensus between stakeholders, represented by the population concerned, business community, community organisations and public authorities,
- b) at the state level, the organisation of emergency response management during the transition period focuses on activities in the period after RH, i.e. in the period of existing exposure situation.

6. implementation of a recovery strategy

- a) the initial definition of the contaminated area is specified during the period of remedy after RH on the basis of the assessment of the results of MRS and more precisely specifies

the requirements for administrative regulation of placing on the market local food (representing a potential significant source of exposure to the population),

- b) MRS of the environment and assessment of the level of contamination of food and drinking water are provided in cooperation with SÚJB, SVS, SZPI, ÚKZÚZ, VÚLHM, SVÚ, VÚV and KHS immediately after the end of the accident phase of RH,
- c) providing support to the population affected by the consequences of RH by the Ministry of Health and the regional authority in the form of providing health care to exposed persons in specialised centres and potential epidemiological monitoring of the health condition of selected groups of the population,
- d) introduction of the system of supervision and assistance at the level of individual regions, including monitoring of doses and active assistance to persons affected by RH. In particular, the recovery period will be essential for the recovery of business activities and for the purpose of ensuring the revitalisation of the affected area where allowed by radiation situation,
- e) RAW management in accordance with the measures of the MPO concept prevents the spread of contamination and minimises the amount of RAW generated during decontamination and management of contaminated production.

7. monitoring and assessment

- a) the effectiveness of the established recovery strategy within the strategy for optimised radiation protection for the administration of the contaminated area is based on long-term monitoring of the results and fulfilment of the objectives set out by these strategies,
- b) the objectives achieved and set out by these strategies, on the basis of which it is subsequently decided in which contaminated area it will be possible to create conditions for the return and stay of the population,
- c) the strategy for optimised radiation protection represents an interactive optimisation process characterised by the scheme shown in Figure 2

1 Decree No. 422/2016 Coll., §110 (3)

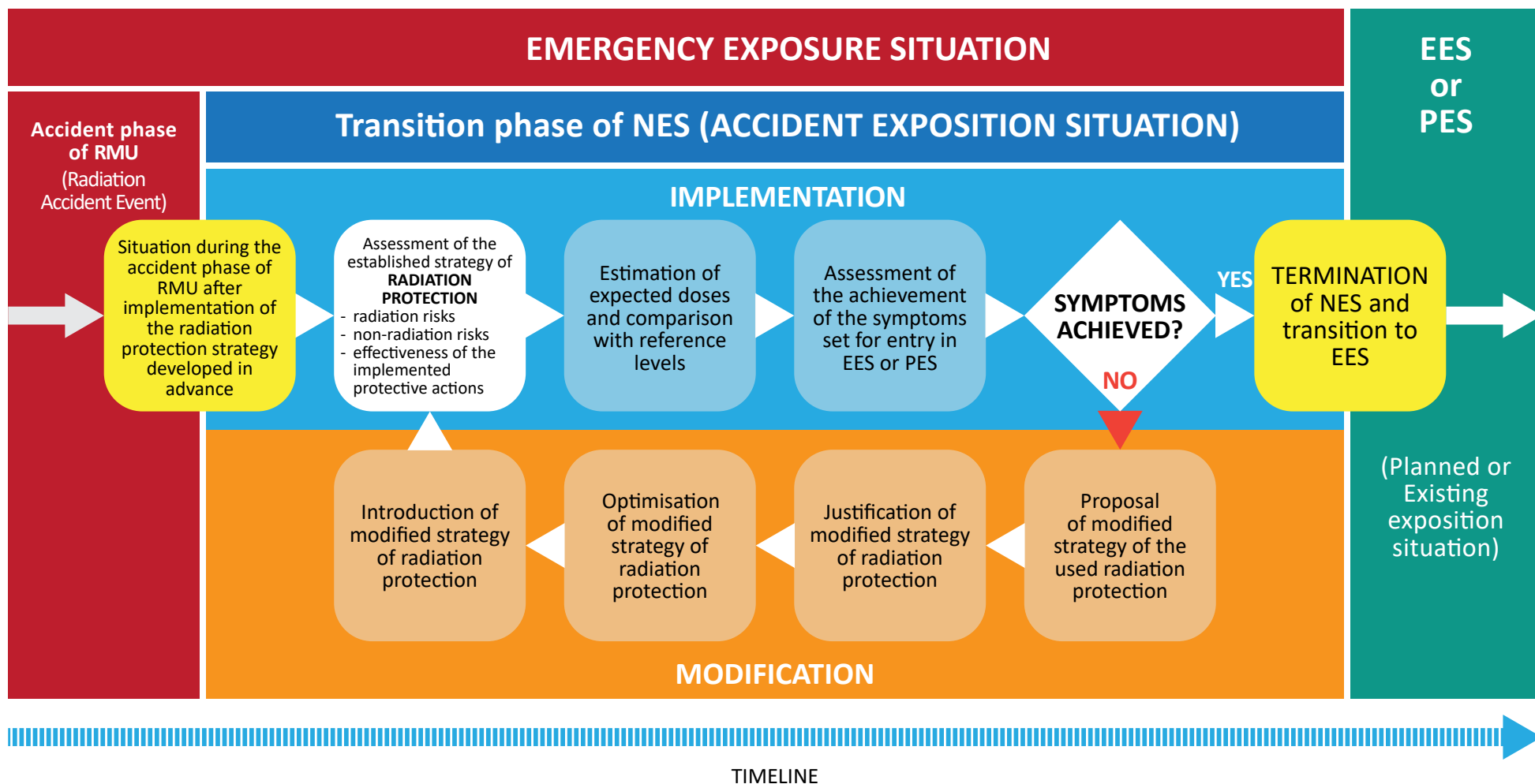


Figure 2: Scheme of the process of optimisation of radiation protection strategy in the transition phase of NES

B.1.1. Definition of contaminated areas by contamination level

Based on the results of MRS contained mainly in the MonRaS database, SÚJB shall assess the extent of the area affected by radioactive fallout and its division into three basic categories - danger zone, restricted access zone and controlled stay zone. The proposal for the definition of contaminated areas by contamination level will be made by SÚJB in maps. The specific method of definition will be closely related to the extent of the individual areas, the level of contamination and, in general, the conditions at the site. The definition can only be administrative, but where the no-entry zone will be defined, it will be more appropriate to ensure that the area is defined to physically prevent the entry. The physical delimitation shall be carried out by the competent IZS units on the basis of an instruction given by the governor, who coordinates these activities within the given region. In the individual zones, a specific approach is taken to the implementation of remedial measures with regard to the possibilities of subsequent recovery of social and business activities.

The criteria for defining the zones of the contaminated area are based on international recommendations, requirements of the European legal framework and Czech legislation, in particular the Atomic Act. In terms of the level of contamination, the following zones are established, each of which has a specific purpose:

1. **Danger zone** – an area in which permanent stay of the population is excluded. Entry is allowed only to persons participating in the implementation of remedial measures and ensuring radiation situation monitoring and in the provision of other necessary activities. The expected effective dose of a representative person in permanent stay, taking into account site-specific conditions when introducing regime measures, would be ≥ 100 mSv/year.
2. **Restricted access zone** – an area where, even with the introduction of regime and other protective actions, the expected effective dose of a representative person in permanent stay as a result of radioactive contamination of the area would be in the range of 20 - 100 mSv/year.
3. **Controlled stay zone** – an area where, for a representative person who complies with the established regime measures, recommended measures in the area of regulation of drinking water and consumption of local agricultural production, including collection of local crops, it is ensured that the sum of expected effective dose and expected committed effective dose does not exceed 20 mSv/year.

The initial definition of contaminated areas after RH is made using dose estimates obtained from MRS of the expected external exposure of the population due to the effects of environmental radioactivity in residential areas and internal exposure in connection with the consumption of contaminated components of the food chain. During the recovery period, dose estimates must be specified and confirmed on the basis of interpretation of the results of MRS of the contaminated area

B.1.2. Pre-established reference levels of doses

for the restriction of the movement and presence of persons in the contaminated area, withdrawal of urgent and introduction of follow-up and other measures to protect the population

According to valid legislation, the justified follow-up protective action is

- a) the restriction of the use of food, water and feed contaminated with radionuclides, when the averted annual committed effective dose is greater than 1 mSv, and
- b) the resettlement of the population, if it is not possible to ensure an effective dose for the population upon return to the affected area of less than 20 mSv over the next 12 months.

When deciding on the withdrawal of the protective actions in place, the exposure that would occur after the withdrawal of the protective actions must be taken into account.

The withdrawal of a protective action including sheltering, evacuation and resettlement of the population is justified if the effective dose over the following 12 months after the withdrawal of the protective action was less than 20 mSv. In those parts of the restricted access zone where even the implementation of decontamination work and the introduction of regulatory measures in the area of staying outside and the introduction of control of food and drinking water sources will not lead to the reference level of the expected effective dose < 20 mSv within 12 months; permanent stay of the population is ruled out and it will be necessary to define precisely the boundaries for the resettlement of the population. Inhabitants must be resettled for a period depending on the level of environmental contamination in the area from which they are resettled.

B.1.3. Establishment of the conditions and regime measures for the use of contaminated areas

As part of ensuring the remediation after RH, SÚJB shall issue proposals for the introduction, clarification or withdrawal of protective actions relating to contaminated areas and members of the public for the area affected by RH or any part thereof in the administration of contaminated area.

SÚJB is entitled to set measures in the form of OOP to regulate exposure in EES, which is a result of RH.

OOP will set reference levels for the regulation of individual exposure, which will be based on the generically set reference levels referred to in point B.1.2, but will reflect the real radiation situation and may differ from these general reference levels - i.e. they may be lower. OOP may also, on the basis of local conditions, set out maximum permitted levels of contamination of food

and feed lower than those set out in Council Regulation (Euratom) 2016/52 of 15 January 2016 laying down maximum permitted levels of radioactive contamination of food and feed following a nuclear accident or any other case of radiological emergency, and repealing Regulation (Euratom) No 3954/87 and Commission Regulations (Euratom) No 944/89 and (Euratom) No 770/90. Determination of these levels of contamination of food and feed shall apply the principle of justification and optimisation in order to keep personal doses, exposure likelihood and the number of exposed persons as low as reasonably achievable, taking into account the current situation, in particular options for supply of uncontaminated food and feed, and others economic and social factors.

Where necessary, OOP may also specify regime measures for the stay and movement of persons in defined zones and other measures necessary in the given situation and related to the regulation of exposure of persons or conditions for further use of the areas concerned.

B.1.4. Principles of basic regulatory measures leading to the limitation of exposure in the contaminated area

B.1.4.1. Regulation of exposure of emergency workers

Requirements for the regulation of the exposure of emergency workers, responsibilities for preparing them for intervention, provision of information, equipment, etc., are explicitly set out in the Atomic Act and its implementing regulations.

The legislation stipulates, inter alia, that in order to restrict the accidental exposure of an emergency worker in NES, effective dose limits for exposed workers shall apply in the first place, namely:

- a) 20 mSv for the sum of effective doses from external exposure and committed effective doses from internal exposure per calendar year.

Where exceeding the exposure limits for exposed workers cannot be ruled out, the accidental exposure to emergency workers shall be optimised using the reference level:

- a) 100 mSv per year, or
- b) in rare cases, 500 mSv per year, if it is a case of saving human lives or preventing the development of NES with potential extensive social and economic consequences.

Should these reference levels be exceeded, the emergency worker may participate in the intervention only with his/her consent.¹

Emergency workers must be prepared in advance for the potential intervention during RH and in the contaminated area. They must be trained to be familiar in particular with the potential effects of ionising radiation, the basic principles of radiation protection, the use of protective equipment and dosimetry devices. Practical training must be part of the preparation for intervention in the contaminated area. Doses received by emergency workers must be evaluated and recorded. During the period of land recovery, workers providing activities in connection with this recovery are already classified and categorised as exposed workers and the limits for exposed workers apply to them.

¹ Act No. 361/2003 Coll. on the Service of Members of the Security Forces. The Security Forces are the Police of the Czech Republic, the Fire Rescue Service of the Czech Republic, the Customs Administration of the Czech Republic, the Prison Service of the Czech Republic, the General Inspectorate of Security Forces, the Security Information Service, and the Office for Foreign Relations and Information. For persons in service, this consent is given by taking an oath of service. And further Act No. 219/1999 Coll. Act on the Armed Forces of the Czech Republic. Consent is given by taking a military oath.

B.1.4.2. Establishment of the conditions for animal and plant production

The basic measure in the contaminated area is to issue a recommendation not to consume locally produced food and not to use drinking water from local sources until the results of monitoring allow to evaluate the content of radionuclides in food and the committed effective dose from their consumption.

The affected area will need to be supplied with uncontaminated food, feed and drinking water as needed.

Within the MRS in the contaminated area in the period of remediation after RH, samples are taken for laboratory analyses in addition to on-site measurement with portable instruments. The MRS will take place in accordance with the National Monitoring Program, primarily in the sampling network of the environment and food chain, or in the human body measurement network, and serves to specify the effective doses received and to define the conditions for animal and plant production. The results of MRS are the input for potential regulation of the consumption of food produced in the affected area and water from local sources. The necessary measures will be issued

by the Ministry of Health or KHS (if the measures concern only one region), depending on the situation also in cooperation with the Ministry of Agriculture or SVS or SZPI.

The Ministry of Agriculture or the SVS ČR takes measures for the survival of livestock and the method of securing them, establishes routes for the relocation of animals to non-contaminated areas and their stabling, and designates the sites for decontamination of transported animals where relocation and decontamination of the animals are assessed as feasible in the given situation. It also sorts livestock in terms of contamination for further commercial use and ensures the regulation of food consumption through the SVS ČR and SZPI. Similarly, potential restrictions are set out for fish and other aquatic animals and wild animals.

Based on the SÚJB proposal, the regime measures will also be set by the Ministry of Agriculture for the use of forests, meadows and fields depending on the season, and measures will be set out for small growers.

B.1.4.3. Establishment of the conditions for decontamination in the affected area

Decontamination of contaminated areas and its extent and complexity will be mainly based on the size of the affected area and the level of contamination. These can be relatively simple decontamination procedures consisting of rinsing or other means of cleaning contaminated surfaces, or technically difficult activities such as land cover, disposal of contaminated vegetation, dismantling of buildings and equipment. The Ministry of Transport, the Ministry of Finance, the Ministry of Regional Development, the Ministry of Agriculture, the Ministry of the Environment and the Administration of State Material Reserves will participate in the implementation of

the strategy for the recovery of the area, and thus especially in ensuring the reduction of the contamination level of the environment, built-up area and aquatic environment.

As part of the remedy after RH, the decontamination of the area affected by radioactive fallout is carried out in accordance with the conditions set out in the strategy for the recovery of the area approved by the Government of the Czech Republic and drawn up by the Ministry of Regional Development in cooperation with the Ministry of Finance and SÚJB.

The strategy for the recovery of the area after RH includes but is not limited to the following conditions for the provision of state aid in recovery:

- a) definition of the affected area to which state aid may be granted,
- b) objectives of the state aid provided and the order of priority,

- c) a list of ministries deciding on state aid,
- d) the volume of funding for these ministries,
- e) forms of state aid (typically programs according to budgetary rules),
- f) designation of the coordinator (region in delegated competence, or designated ministry).

B.1.4.4. Establishment of the conditions for storage and treatment of contaminated waste

The management of contaminated waste, which is not RAW generated during the recovery of the contaminated area, is governed by the concept set by the Ministry of the Environment in cooperation with the Ministry of Health¹. RAW management is governed by the Concept of RAW and Spent Nuclear Fuel Management in the Czech Republic² drawn up by the Ministry of Industry and Trade. Waste contaminated with radionuclides as a result of decontamination works in the area affected by radioactive fallout will (among other things also depending on the season in which the accident occurred) differ significantly in volume, material composition and levels of specific activity or activity concentration from RAW produced by NPP under normal operating conditions. Therefore, it is necessary to prepare in advance different technological procedures for the implementation of decontamination work and the treatment of contaminated waste

generated during such work. Elimination of the increase in the amount of RAW requires that the solutions chosen for RAW management and temporary storage be gradually replaced during EES by solutions for permanent storage.

Part of the waste produced in the restricted access zone or in the controlled stay zone, which meets the criteria for release according to Decree No. 422/2016 Coll., can be handled as conventional municipal waste.

The implementation of the established procedures will be ensured by companies that specialise in these activities.

¹ The basic rules for waste management are laid down in Act No. 185/2001 Coll., on Waste and Amendments to Some Other Acts, as amended.

² The Concept of RAW and Spent Nuclear Fuel Management in the Czech Republic, approved on 26 August 2019 by Government Resolution No. 597/2019

B.2. Symptoms for the transition from an emergency exposure situation to an existing exposure situation

The transition from NES to EES can take place in different parts of the ZHP or the contaminated area beyond the ZHP at different times, depending on the level of contamination. The basic assumption is that the situation is under control and the release of RaL into the environment is stopped. In the case of RH occurred in connection with threat categories D and E, the transition

of NES to EES takes place in connection with the termination of uncontrolled release and further spread of RaL to the surroundings. Determining the current type of exposure situation is mainly important due to the different regulatory criteria and procedures set out for individual exposure situations.

B.2.1. Main symptoms for the transition from NES to EES

The main symptoms for the transition from NES to EES are:

- a) termination of radioactive release from the plant affected by RMU, when the radiation source is already under control,
- b) termination of emergency MRS of the contaminated area,
- c) withdrawal of announced urgent protective actions,
- d) identification of the most affected population groups and exposure routes that contribute most to the effective dose received,
- e) evaluation of radiation and non-radiation risks in the assessed area at a given time, as well as assessment of their further development,
- f) definition of the danger zone and prevention of access by unauthorised persons,
- g) definition of the zone with restricted access and controlled stay,
- h) creation of technical and administrative conditions for the entry and exit of persons, equipment and facilities into and from the restricted access zone,
- i) termination of decontamination of critical infrastructure elements,
- j) definition of the area suitable for the return of the population and, where appropriate, determination of the conditions for long-term stay therein,
- k) gradual recovery of the functionality of individual elements of critical infrastructure and creation of conditions for the commencement of the provision of critical infrastructure services in the area,
- l) creation of conditions for the resumption of operation of medical facilities, public and regional and local authorities, IZS units and the water and food supply system,
- m) creation of conditions for the renewal of technical services, including supply of energy, heat and the functionality of the municipal waste collection system and wastewater treatment.

During the transition phase of NES, based on the evaluation of the results of the detailed emergency MRS, SÚJB will propose the definition of contaminated areas by contamination level, in which it will be possible to create conditions for the return and stay of the population in the contaminated area.

The aim of the activities in the transition phase of NES is the effort to create conditions for the stay of people in the contaminated area to ensure that the set reference level for a representative person is not exceeded. Radiation protection measures set out within the given strategy are continuously optimised in accordance with the results of emergency MRS.

B.3. Arrangements for prompt coordination of the procedure

between organisations involved in radiation extraordinary event management in the Czech Republic and with other Member States of the European Union and Euratom and with third countries which may be involved or are likely to be affected by situation associated with the radiation accident

B.3.1. Foreign communication

The scheme of communication flows between the Czech Republic and foreign countries is shown in the figures given in point **C. 1 Communication plan**.

B.3.2. Coordination of action with neighbouring countries

In the case of RH outside the territory of the Czech Republic, the introduction of some forms of urgent protective actions (warning, sheltering, iodine prophylaxis) in the Czech Republic cannot be ruled out. Based on the radiation situation monitoring, or information and data received from abroad, SÚJB shall issue recommendations to the competent authorities for the potential introduction of adequate protective actions. These recommendations will be communicated in real time, in particular to ensure the consistency of the measures taken in border areas. It is not desirable for urgent but also follow-up measures to differ significantly from those taken in the neighbouring country of origin of RMU. This consistency is particularly ensured through bilateral agreements concluded with all neighbouring countries, as well as bilateral and multilateral negotiations with these and other countries.

Bilateral and multilateral agreements with neighbouring countries are concluded with

- Slovakia (Agreement between the Government of the Czech Republic and the Government of the Slovak Republic on Cooperation in the Field of State Supervision of Nuclear Safety of Nuclear Installations and State Supervision of Nuclear Material and Agreement between the Government

of the Czech Republic and the Government of the Slovak Republic on Early Notification of a Nuclear Accident),

- Poland (Agreement between the Government of the Czech Republic and the Government of the Republic of Poland on Early Notification of a Nuclear Accident and Exchange of Information on the Peaceful Uses of Nuclear Energy, Nuclear Safety and Radiation Protection),
- the Federal Republic of Germany (Agreement between the Government of the Czech and Slovak Federal Republic and the Government of the Federal Republic of Germany on Issues of Common Interest in the Field of Nuclear Safety and Radiation Protection); regular annual consultation meetings are held with Germany,
- Austria (Agreement between the Government of the Czech Republic and the Government of the Republic of Austria on Issues of Common Interest in the Field of Nuclear Safety and Radiation Protection and Protocol between the Government of the Czech Republic and the Government of the Republic of Austria amending the Agreement between the Government of the Czechoslovakia

an Socialist Republic and the Government of the Republic of Austria on Issues of Common Interest in the Field of Nuclear Safety and Radiation Protection); regular annual consultation meetings are also held with Austria,

- Hungary (Agreement between the Government of the Czech and Slovak Federal Republic and the Government of the Republic of Hungary on the Exchange of Information and Cooperation in the Field of Nuclear Safety and Radiation Protection).

B.3.2.1. IAEA USIE

The Czech Republic is a signatory to the Convention on Early Notification of a Nuclear Accident (Vienna, 26 September 1986, Communication of the Ministry of Foreign Affairs No. 116/1996 Coll.). Under this Convention, the contact point for receiving information on a nuclear accident or radiation accident is the OPIS MV-GŘ HZS ČR. In the web platform “Unified System for Information Exchange in Incidents and Emergencies” (hereinafter referred to as “USIE”), which is operated by the IAEA and which serves for the international (i.e. even outside the EU) exchange

of information on RMU, OPIS MV-GŘ HZS ČR plays the role of “National Warning Point”. In case of receipt of information on the occurrence of RH abroad, it forwards the information to the Contact Point of SÚJB. SÚJB receives the same information directly from this platform, due to its role of the “National Competent Authority”. The exchange of information through USIE takes place throughout the RMU and the situation is dealt with by KŠ SÚJB, or ÚKŠ and KŠ at the regional and municipal levels.

B.3.2.2. IAEA (RANET)

The Czech Republic signed the International Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Vienna, 26 September 1986, Communication of the Ministry of Foreign Affairs No. 115/1998 Coll.), on the basis of which the RANET network was established, of which the Czech Republic has been a part since 2009. Within the RANET network, the Parties to

the above Convention have registered their national capacities in the field of MRS, for example in the search for sources of ionising radiation, in radiation surveys, in radiation assessment of RMU or after decontamination. If necessary, the member states are ready to provide their capacities to assist other member states. The request for assistance is provided through the IAEA USIE platform.

B.3.2.3. European Commission and Euratom

Based on European Union and Euratom legislation, bilateral agreements and international conventions, the countries of the European Union and Euratom, neighbouring countries and the IAEA are informed of any RH which may have a cross-border impact. The international platform for informing about RH, which is provided by the European Commission, is the WebECURIE system.

Towards the European Union and Euratom, SÚJB plays the role of the Competent Authority and the OPIS MV-GŘ HZS ČR plays the role of the Contact Point. OPIS MV-GŘ HZS ČR is the primary recipient of messages from WebECURIE and, after its receipt and acknowledgement, it forwards the message to SÚJB.

The WebECURIE system as well as the contact point (OPIS MV–GŘ HZS ČR), operates on a 24/7 basis on the principle of the so-called “callout system”. This system is based on automatic informing of the user by phone, fax or e-mail. This service is provided by callout servers of the European Union. Unless otherwise specified, all information shared through WebECURIE is available to all contact

points and national authorities. The WebECURIE system is regularly verified in the form of simple communication tests and also with the help of a pre-announced emergency communication exercise according to a predefined scenario (ECUREX exercise).

C. ANNEXES

C.1. Communication plan

C.1.1. Notification schemes within the Czech Republic

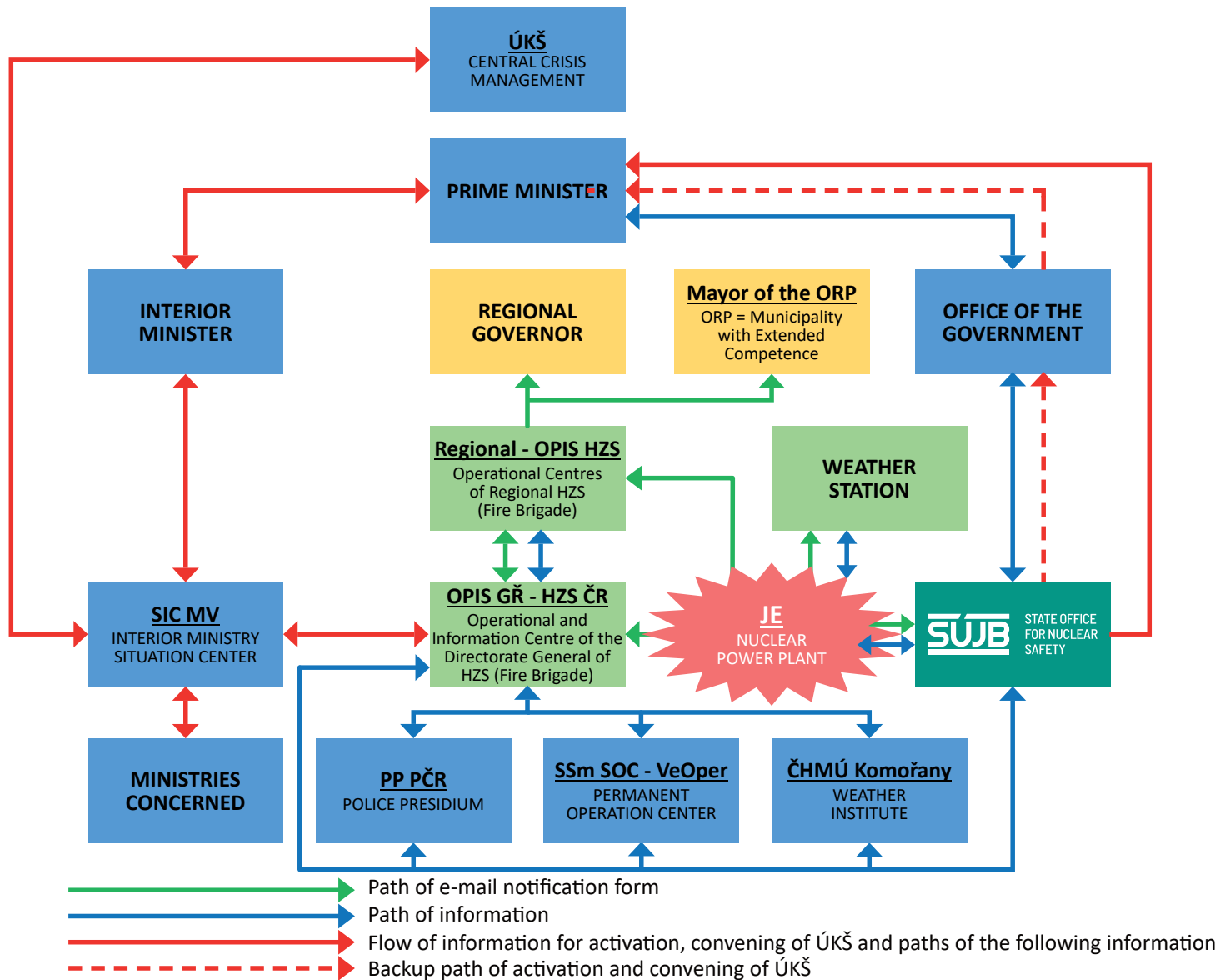


Figure 3: Basic communication scheme for activation of KŠ in the case of RH at NPP leading to the declaration of a state of emergency

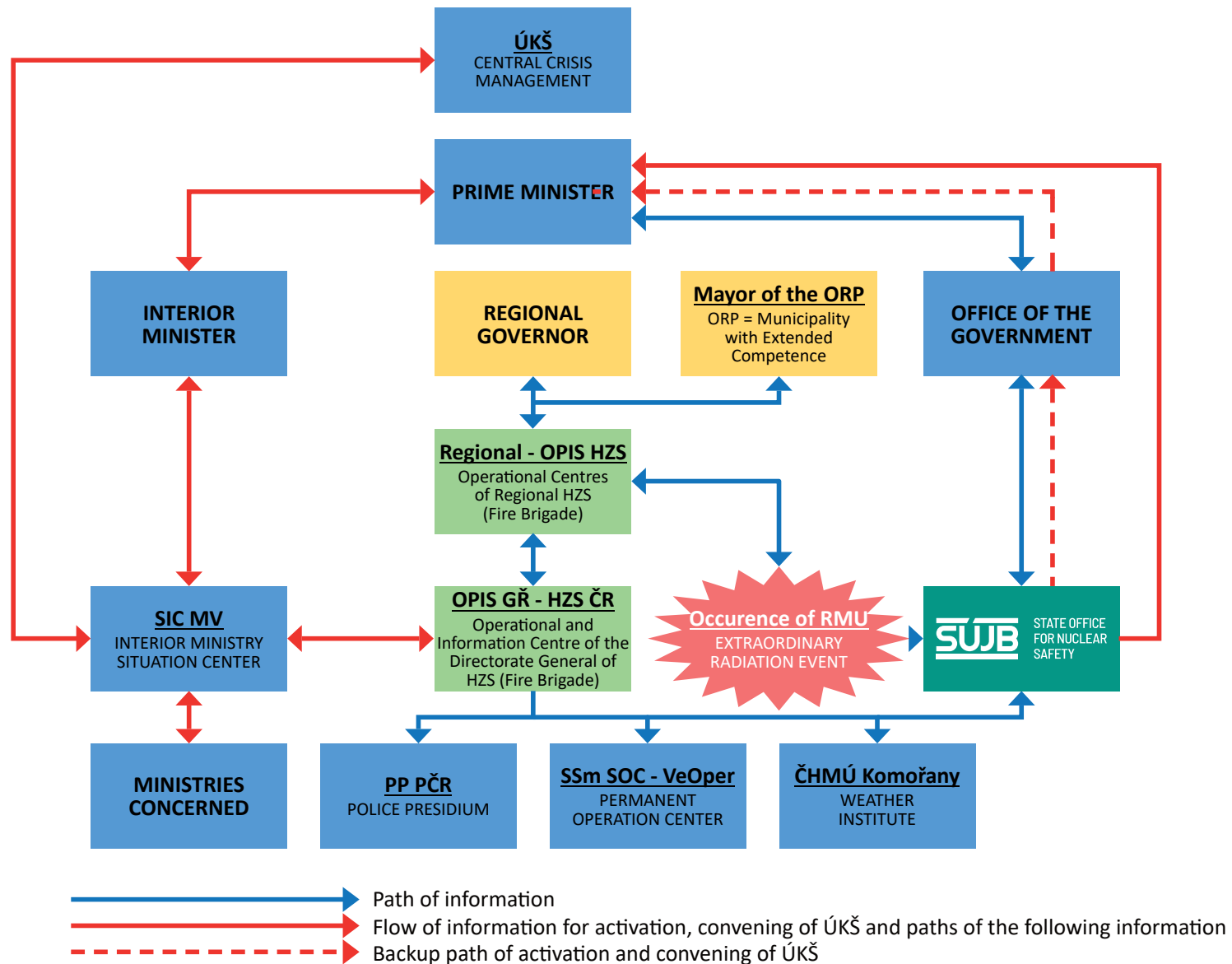


Figure 4: Basic communication scheme for activation of KŠ in the case of RH as a result of threat category D leading to the declaration of a state of emergency

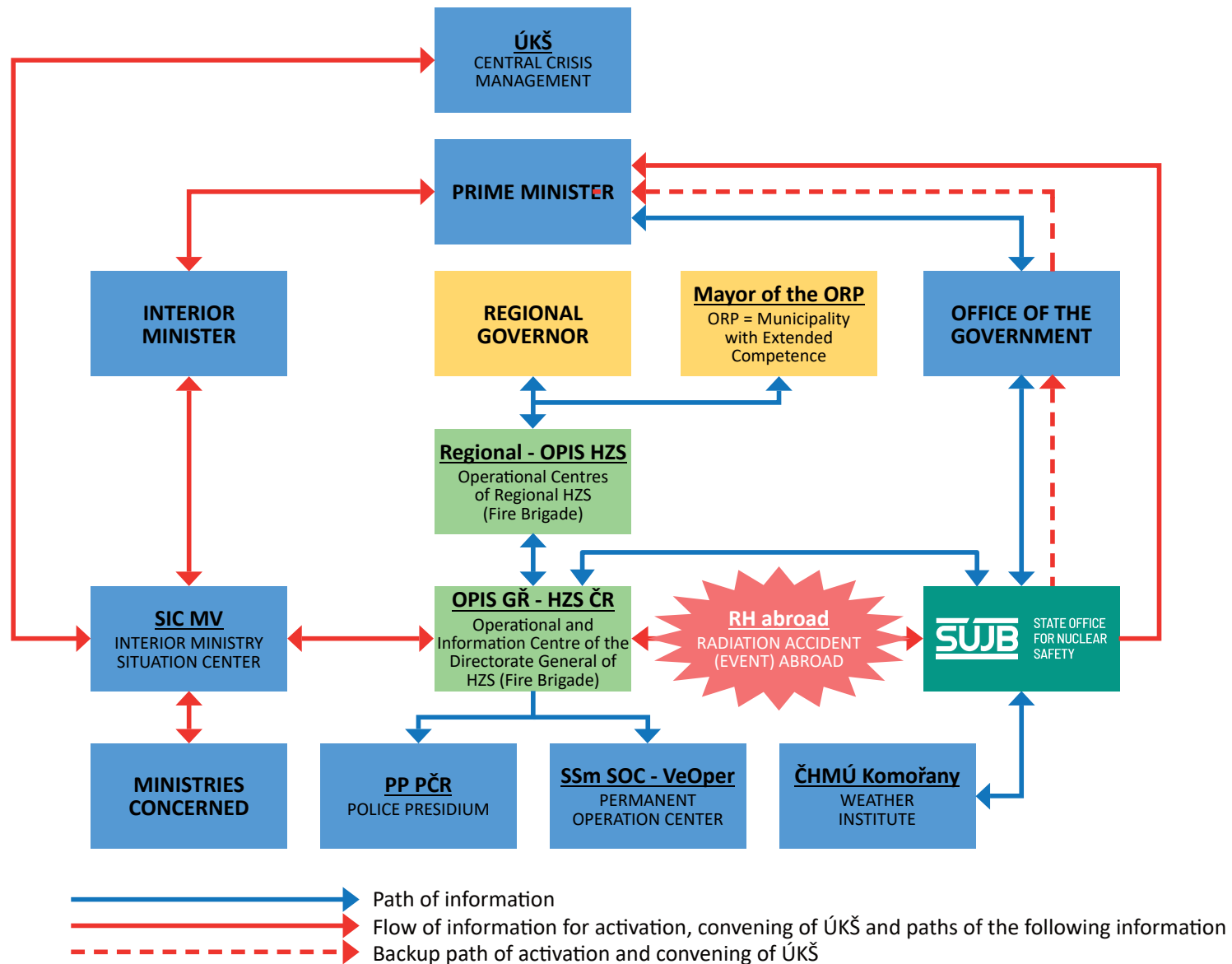
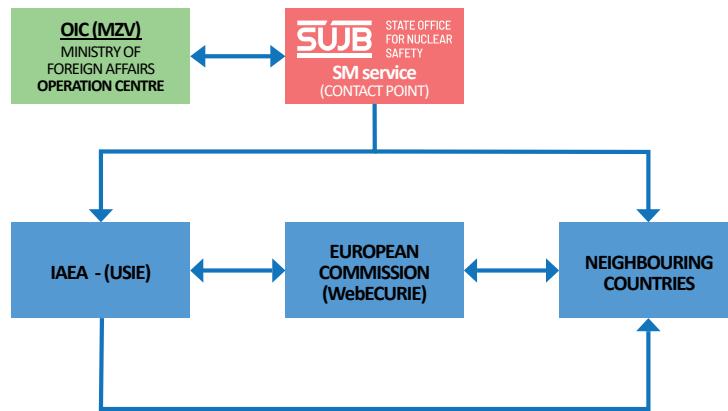
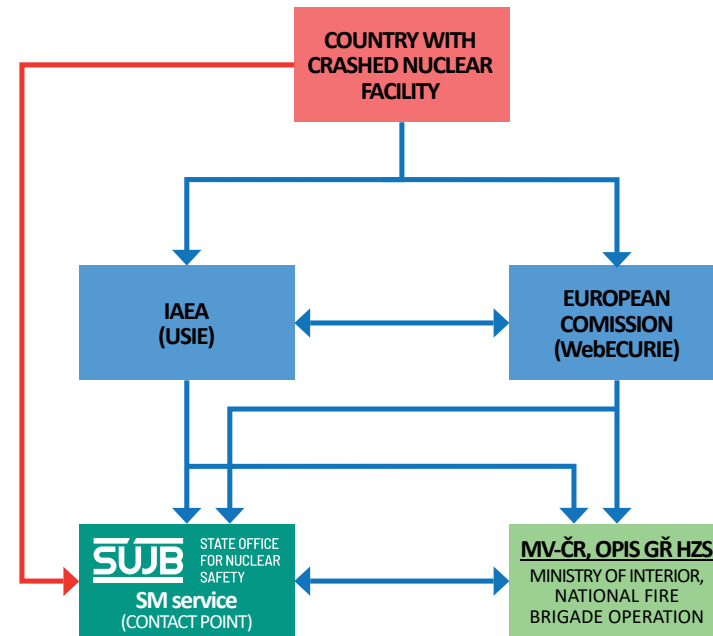


Figure 5: Basic communication scheme for activation of KŠ during RH at NPP outside the Czech Republic with impacts on the territory of the Czech Republic

C.1.2. Data transfer abroad



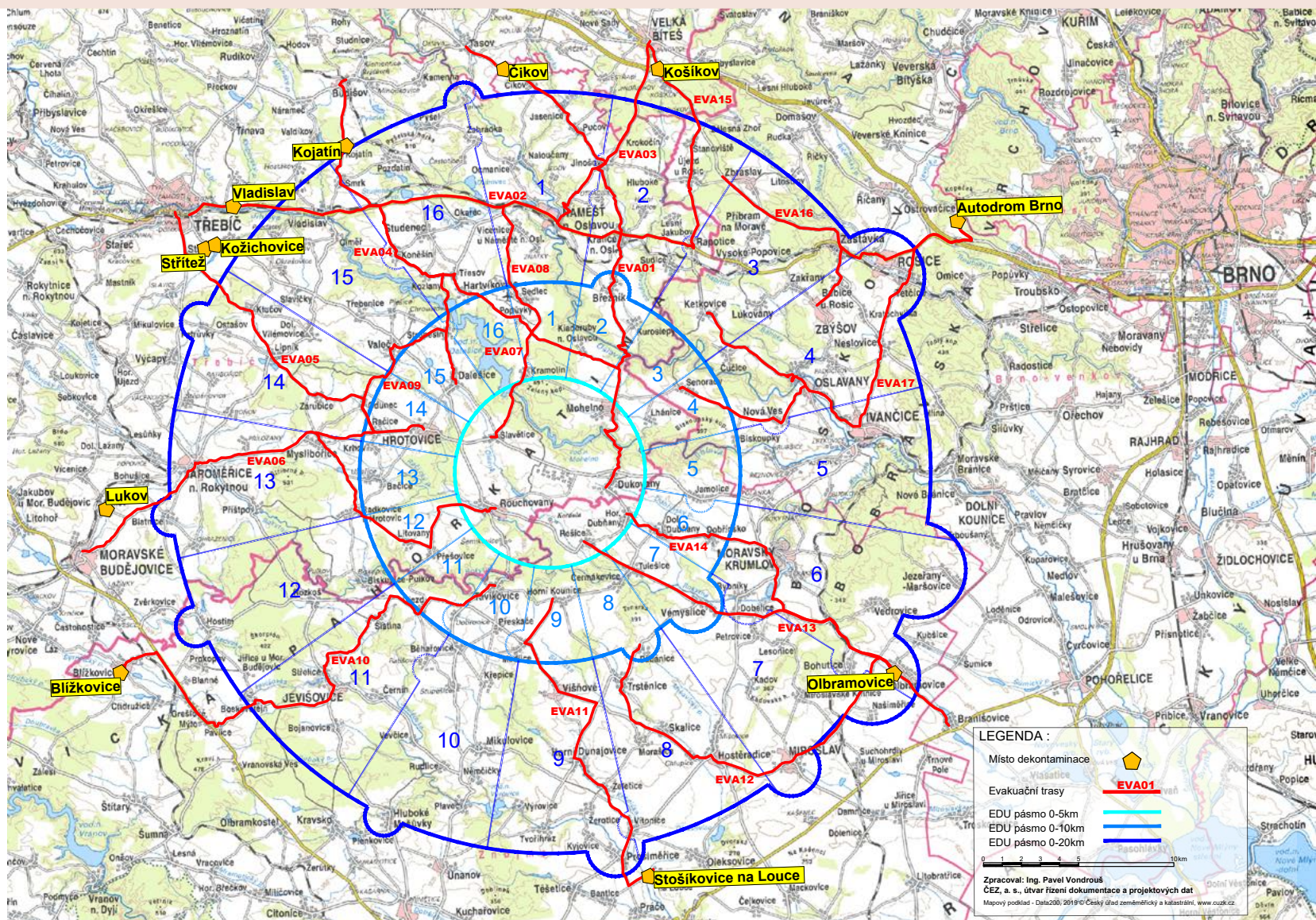
C.1.3. Receipt of information regarding radiation accident abroad



→ only if bilateral agreement is concluded

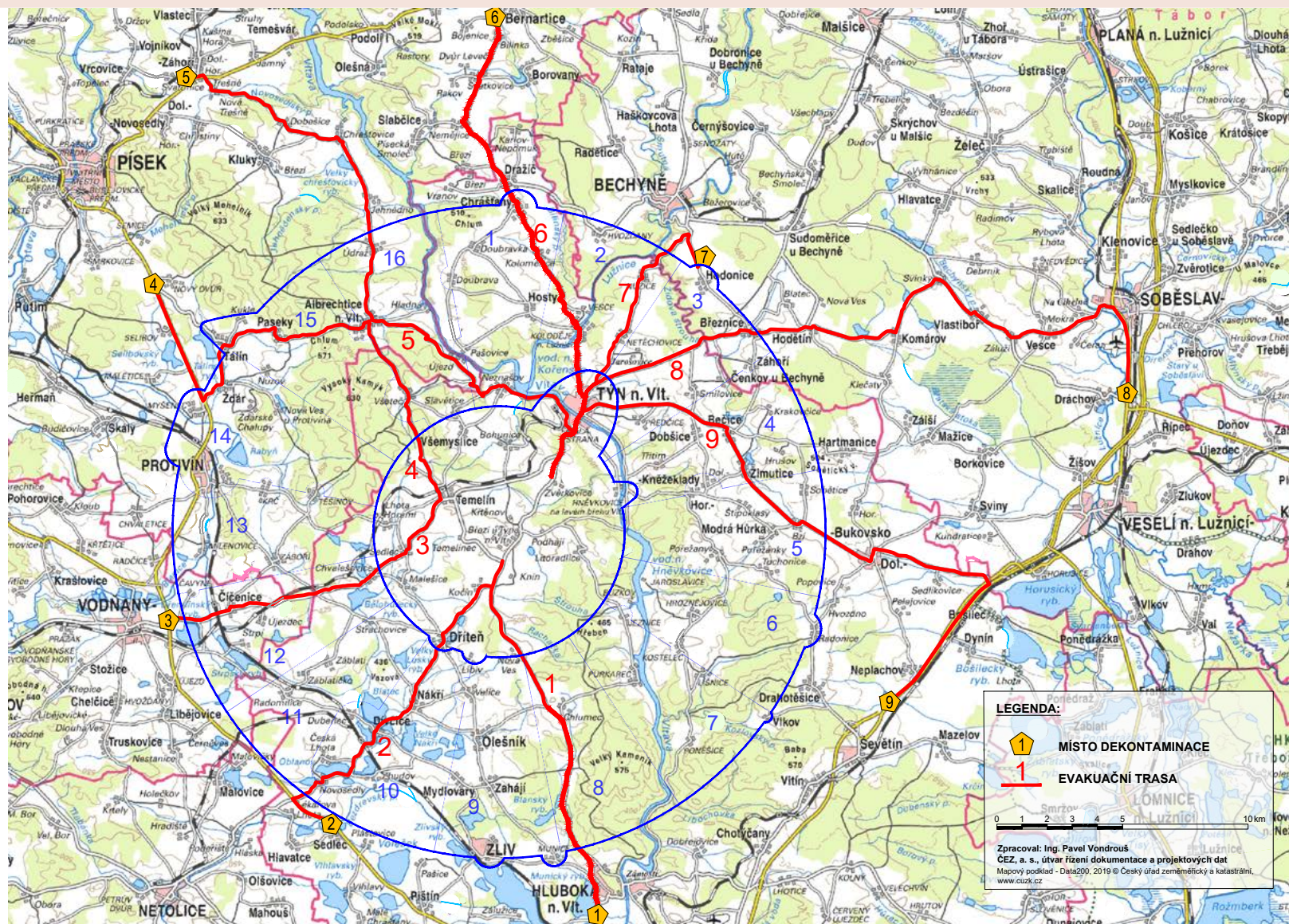
C.2. Digitalised map with indicated emergency planning zones and areas under point A.1

C.2.1. Map of the ZHP of the Dukovany NPP



Digitised maps with marked ZHPs and areas according to point A.2. are available in vector format at www.sujb.cz/nrhp.

C.2.2. Map of the ZHP of the Temelín NPP



C.3. ABBREVIATIONS

AZ	Atomic Act	OPIS	Operational and information centre
BRS	National Security Council	OOP	General measures
ČHMÚ	Czech Hydrometeorological Institute	ORP	Municipality with extended competence
ČR	Czech Republic	PES	Planned exposure situation
EES	Existing exposure situation	PP PČR	Police Presidium of the Czech Republic
HZS	Fire Rescue Service	PŘ	Food chain
IAEA	International Atomic Energy Agency	RaL	Radioactive material
IZS	Integrated rescue system	RAW	Radioactive waste
NPP	Nuclear power plant	RMU	Radiation extraordinary event
JZ	Nuclear installation	RH	Radiation accident
KI	Potassium iodide	RN	Radiation incident
KŠ	Crisis staff	SSHR	Administration of State Material Reserves
KÚ	Regional authority	SIC MV	Situation and Information Centre of the Ministry of the Interior
MD	Ministry of Transport	SM	Contact point
MF	Ministry of FinanceCommand	SSm SOCVeOper	Permanent shift of the Joint Operations Centre of the Operations
MMR	Ministry of Regional Development	SÚJB	State Office for Nuclear Safety
MO	Ministry of Defence	SÚRO	National Radiation Protection Institute
MonRaS	SW tool (Radiation Situation Monitoring)	SVS	State Veterinary Administration
MPO	Ministry of Industry and Trade	SVÚ	State Veterinary Institute
MRS	Radiation situation monitoring	SVZ	Early warning network
MV	Ministry of the Interior	SZPI	Agricultural and Food Inspection Authority
MV-GŘ HZS ČR	Ministry of the Interior - General Directorate of Fire Rescue Service of the Czech Republic	ÚKŠ	Central Crisis Staff
MZ	Ministry of Health	USIE	Unified System for Information Exchange in Incidents and Emergencies
MZe	Ministry of Agriculture	ÚSÚ	Central authorities
MZV	Ministry of Foreign Affairs	ÚKZÚZ	Central Institute for Supervising and Testing in Agriculture
MŽP	Ministry of the Environment	VHP	Off-site emergency plan
NES	Emergency exposure situation	VÚLHM	Forestry and Game Management Research Institute
NRHP	National Radiation Emergency Plan	VÚV	T. G. Masaryk Water Research Institute
OIC	Operational and information centre	ZHP	Emergency planning zone
OO	Protective actions	ŽP	Environment

C.4. DEFINITIONS

Accidental exposure	§ 2 (3) d) of the Atomic Act,	Exposure received by an individual other than emergency worker as a consequence of an emergency exposure situation and exposure received by an emergency worker in an emergency exposure situation.
Nuclear installation	§ 3 (2) e) of the Atomic Act,	<p>Nuclear installation within the meaning of the National Radiation Emergency Plan means</p> <ul style="list-style-type: none"> a) a facility or plant comprising a nuclear reactor using fission chain reaction or other nuclear chain reaction, b) a storage facility for spent fuel, c) a storage facility for fresh nuclear fuel, unless part of another nuclear installation, d) a storage facility for radioactive waste, except installations for the storage of radioactive waste, which is part of another nuclear installation or workplace where activity involving radiation is performed, e) a radioactive waste disposal facility, except repositories containing exclusively natural radionuclides
Threat category	§ 2 (1) of Decree No. 359/2016 Coll.,	<p>Depending on the possible impacts of radiation incident or radiation accident on the territory of the Czech Republic, a nuclear installation, workplace with ionising radiation sources or activity in exposure situations shall be classified into threat categories A to D, specifically</p> <ul style="list-style-type: none"> a) threat category A includes a power nuclear installation, b) threat category B includes a nuclear installation, which is not included in threat category A, and category IV workplace other than workplace with a nuclear facility where radiation accident may occur, c) threat category C includes a nuclear installation or workplace with ionising radiation sources where radiation accident cannot occur, or d) threat category D includes an activity in exposure situations, including finding, misuse or loss of a radionuclide source or transport of radioactive or fissile material, which cannot cause a radiation incident or a radiation accident in an unpredictable location, and thus accidental exposure. <p>Threat category E includes areas on the territory of the Czech Republic where protective actions for the public could be implemented as a result of a radiation accident occurred in a nuclear installation or at workplace with ionising radiation sources situated on the territory of the neighbouring state of the Czech Republic.</p>
Critical infrastructure	§ 2 g) of Act No. 240/2000 Coll.,	The element of critical infrastructure or the system of elements of critical infrastructure, disruption of which would have a significant impact on the State security, on ensuring the basic living needs of the population, on health of people and State economy.
Emergency event	§ 2 b) of Act No. 239/2000 Coll.,	Harmful effects of forces and events caused by human activity, natural effects and also the accidents threatening life, health, property or environment, requiring rescue and relief work.
Radioactive waste management	§ 3 (2) b) of the Atomic Act,	All activities that relate to collection, segregation, treatment, conditioning, storage, or disposal of radioactive waste, excluding transportation from the site where these activities are carried out.
National Radiation Emergency Plan	§ 4 (1) l) of the Atomic Act,	Plan drawn up for the territory of the Czech Republic outside nuclear installation grounds or category IV workplaces to prepare for the management and implementation of a response to a radiation incident or radiation accident with an impact outside the emergency planning zone.

Protective action	§ 104, Atomic Act, 239/2000 Coll.,	Activities aimed at ensuring the protection of the population in the event of a radiation accident, including urgent protective actions (sheltering, application of iodine prophylaxis and evacuation) and follow-up protective actions (in particular resettlement, regulation of the movement of persons and regulation of the use of food and feed).
State of emergency	Article 5, Act No. 110/1998 Coll.,	The state declared by the Government of the Czech Republic or the Prime Minister of the Czech Republic in the event of natural disasters, ecological or industrial accidents, incidents or other dangers which to a significant extent threaten lives, health, property values or internal order and security.
Radiation extraordinary event response	§ 151 a) of the Atomic Act,	Application of a set of measures to manage a situation related to the occurrence of a radiation extraordinary event, with the aim of regaining control over the situation and preventing and mitigating the consequences of the radiation extraordinary event that has arisen, including non-radiation consequences.
Category IV workplace	§ 19 (4) of Decree No. 422/2016 Coll.,	Workplace handling a nuclear installation or workplace handling a nuclear waste repository that is not a nuclear installation.
Radiation extraordinary event response preparedness	§ 151 b) of the Atomic Act,	A set of organisational, technical, material and personnel measures prepared according to the likely course of a radiation extraordinary event in order to avert or mitigate its impacts; these measures may take the form of intervention instructions, on-site emergency plan, emergency regulations, plan for carrying out rescue and relief work in the vicinity of the source of danger (hereinafter referred to as the “off-site emergency plan”) and the National Radiation Emergency Plan.
Radiation accident	§ 4 (1) d) of the Atomic Act,	Radiation extraordinary event that cannot be handled by forces and means of the operators or shift personnel of the person whose activities gave rise to the radiation extraordinary event or has resulted from the finding, misuse or loss of a radionuclide source which requires taking urgent actions to protect the general public.
Radiation extraordinary event	§ 4 (1) a) of the Atomic Act,	Event that leads or may lead to exceeding of exposure dose limits and requires action to prevent the exceeding of the limits or deterioration of the situation from the standpoint of radiation protection assurance.
Radiation incident	§ 4 (1) c) of the Atomic Act,	Radiation extraordinary event that cannot be handled by forces and means of the operators or shift personnel of the person whose activities gave rise to the radiation extraordinary event or has resulted from the finding, misuse or loss of a radionuclide source which does not require taking urgent actions to protect the general public.
Radioactive waste	§ 3 (2) a) of the Atomic Act,	Item which is a radioactive substance or an article or equipment containing or contaminated by a radioactive substance, for which no further use is foreseen and which does not satisfy the conditions laid down in this Act for the discharge of radioactive substances from a workplace.
Emergency planning zone	§ 4 (1) k) of the Atomic Act	Area surrounding the nuclear installation grounds or category IV workplace in which, based on radiation extraordinary event analysis and assessment, the requirements for preparation for taking urgent protective actions under § 104 (1) a) of Act No. 263/2016 Coll., other measures to protect the general public as a result of the expected exceeding of reference levels and other measures to protect the general public apply.
Radiation extraordinary event management	§ 4 (1) e) of the Atomic Act,	System of procedures and measures to ensure <ol style="list-style-type: none"> 1. analysis and assessment of impacts of potential radiation extraordinary event which means; analysis of radiation extraordinary events coming into consideration and assessing their impacts, 2. radiation extraordinary event response preparedness, 3. radiation extraordinary event response, and 4. remedial action after a radiation accident

NRHP

National Radiation Emergency Plan