EPREV REPORT

PEER APPRAISAL OF THE ARRANGEMENTS IN THE REPUBLIC OF BELARUS REGARDING THE PREPAREDNESS FOR RESPONDING TO A RADIATION EMERGENCY

4 – 8 October 2010
Minsk, Belarus
International Atomic Energy Agency

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FOREWORD

The International Atomic Energy Agency (IAEA) has the statutory functions of establishing standards of safety for the protection of health against exposure to ionizing radiation, and of providing for the application of these standards. In addition, under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency [1] the IAEA will, if requested, assist Member States in preparing emergency arrangements for coping with nuclear accidents and radiological emergencies.

In response to a request from the Ministry of Emergency Situations of the Republic of Belarus, the IAEA conducted an Emergency Preparedness Review (EPREV) mission to Belarus to carry out a peer review of the country's emergency preparedness and response arrangements vis-à-vis the relevant IAEA standards and guidelines developed for the EPREV services.

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1. INTRODUCTION

1.1. Background

The obligations, responsibilities and requirements for preparedness for and response to nuclear and radiological emergencies are set out in the Safety Standards, in particular the "Requirements" document "Preparedness and Response for a Nuclear or Radiological Emergency" (GS-R-2) [2]. The IAEA General Conference, in resolution GC(46)/RES/9, encouraged Member States to "implement the Safety Requirements for Preparedness and Response to a Nuclear or Radiological Emergency".

In 2003, the IAEA published the document "Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency" (EPR-METHOD-2003) [3]. Another document entitled "Arrangements for Preparedness for a Nuclear or Radiological Emergency", (Safety Guide No. GS-G-2.1) [4] was published in 2007 with the aim of fulfilling in part the IAEA's function under Article 5 of the Assistance Convention to provide a compendium of best practices for planners aiming to comply with the IAEA Requirements [2].

In response to a request from Belarus, in accordance with the above, the EPREV mission was implemented from 4 – 8 October 2010.

The overall objectives of the mission were:

- To provide an assessment of the State's capability to respond to radiation[1] incidents and emergencies;
- To assist the State in the development of interim arrangements to promptly respond to a nuclear or radiological emergency, including suggested steps that can be taken immediately to better use existing capabilities;
- To assist the State in providing a basis upon which the State can develop a longer-term program to enhance its ability to respond, taking into account future nuclear installations in Belarus.

[1] In this context, a 'radiation emergency' means the same as a 'nuclear or radiological emergency'.

1.2. Scope

The review focused on the ability of the relevant institutions and organizations in Belarus to respond to a radiation incident or emergency and was based on an assessment of existing response arrangements and capabilities. The mission did not make an appraisal of the status of the development of national regulatory infrastructure and reviewed the regulatory conditions only in relation to preparedness to responding to radiation emergencies.

The review consisted of:

- Determining if the arrangements for preparedness and response for radiation emergencies within the Republic of Belarus were in conformity with the requirements of GS-R-2 [2];
- Identifying methods and means of reaching better compliance with the international requirements and other good practices. EPR-METHOD [3] and the expertise of the mission team members provided the basis for these recommendations;
- Reviewing and verifying the statements and rating (Performance Indicators) made by the Belarus counterpart in the self-assessment questionnaire.

In order to focus the effort and to provide recommendations that would be generally applicable to the existing preparedness and response system of the Republic of Belarus, the arrangements for dealing with the following types of situations warranting emergency preparedness were specifically examined:

- The ability of facilities in threat category III (Belarus does not have any facilities in threat category I and II) to respond to radiological emergencies;
- The ability to respond to a radiological emergency (threat category IV) that could occur anywhere in the country;
- The ability to respond to radiological or nuclear events in neighboring countries, (corresponding to threat category V).

The following aspects of emergency preparedness and response were assessed at local and national levels:

- Emergency management
- Emergency preparedness
- Law enforcement
- Radiation protection
- Medical response
- Public information
- National capability to support and provide training to local response teams

The Joint Institute for Power and Nuclear Research Sosny, Institute for Retraining and Professional Development (IRPD) of the MES, Command and Engineering Institute (CEI) of the MES, Republican Center for Emergency Management and Response (RCEMR) of the MES and Republican Special Response Team (RSRT) of MES were visited during the mission.

Emergency arrangements at the Joint Institute for Power and Nuclear Research Sosny (one of the main license holders operating facilities with nuclear materials and highly active radiation sources) were considered as a typical example and were assessed in details.

It was not foreseen to visit other facilities than those listed above or to perform other review activities. The collected and analyzed information presented in this report is based on studying the available legislation, on interviews with the representatives of key response organizations and on expert judgment made as a result of meetings with Belarusian officials and visits to different sites and institutions. The mission concentrated its efforts on those areas that, in the team's opinion, are crucial to the establishment of a solid emergency response capability in Belarus.

As a part of the appraisal methodology, the completed self-assessment questionnaire was re-examined during the mission. The EPREV team, based on interviews and documents obtained, made an independent assessment of the prevailing situation in the area of emergency preparedness and response in Belarus, regarding all appraisal criteria.

1.3. The Review Process

Approach, tasks and activities prior to the EPREV mission

To assist the counterpart in the preparation for the mission, the IAEA provided a pre-appraisal questionnaire addressing the main issues and requirements of GS-R-2 [2]. During the mission, on the request of the EPREV team, MES, MH and other key institutions provided a range of documents including current legislation, regulations, procedures and presentations and made them available to the EPREV team members (APPENDIX 1). Most of the documents were available only in Russian.

A detailed day-by-day work schedule was proposed by MES and amended by the IAEA staff before the mission. It was further adapted during the mission at the request of the EPREV team.

The key organizations with which the mission team interacted

The detailed work schedule with a brief description of the meetings and visits is given in Table 1 (Mission Schedule). The mission team visited the authorities and facilities in accordance with the schedule and conducted interviews and discussions.

The major organizations with which the mission team interacted were:

- Ministry of Emergency Situations of the Republic of Belarus (MES)
- Ministry of Health of the Republic of Belarus (MH)
- Ministry of Interior of the Republic of Belarus (MI)
- Ministry of Defense of the Republic of Belarus (MD)
- Command and Engineering Institute (CEI) of the MES
- Institute for Retraining and Professional Development (IRPD) of the MES
- Republican Center for Emergency Management and Response (RCEMR) of the MES
- Republican Special Response Team (RSRT)
- Center of Chemical and Radiation Protection of the RSRT
- GOSATOMNADZOR of MES (GOSATOMNADZOR)
- Committee of Border Security of the Republic of Belarus (CBS)
- State Custom Committee of the Republic of Belarus (SCC)

- Scientific and Research Institute of Fire Safety and Emergencies (SRIFSE)
- Joint Institute for Power and Nuclear Research Sosny (SOSNY)

Conduct of the appraisal

The appraisal process included:

- Meetings with officials of major Governmental Institutions having responsibilities for emergency preparedness and response (MES, MH, MI, MD, CC, CBS, GOSATOMNADZOR);
- Interviews with the representatives of operators and response organizations;
- Visits to operators and facilities involved in response to radiation emergencies;
- Prior to departing from the Republic of Belarus, preparation of draft findings and recommendations based on information gathered against EPREV criteria;
- An exit meeting with officials of MES, where the preliminary findings and recommendations of the EPREV team were presented.

EPREV Team

The members of the EPREV team (see APPENDIX 13) were selected on the basis of their relevant experience in the above-mentioned areas. The team consisted of Peter ZOMBORI (Team Leader, IEC/IAEA), Albinas MASTAUSKAS (Lithuania), Vera STAROSTOVA (Czech Republic) and Karol JANKO (Slovak Republic).

Table 1 Mission Schedule

DATE	SUBJECT
Day 1 4 October	**Location: Minsk.** **Host: Ministry of Emergency Situations of the Republic of Belarus** Excursion around Command and Engineering Institute of the MES **Introductory discussions with major participants, representatives of the MES, MH, MI, MD, CC, CBS, CC and presentation of current status.** Presentations : • State System of Emergency Prevention and Liquidation and Civil Defense. • Structure, functions and tasks of the Ministry for Emergency Situations of the Republic of Belarus. • Supervision in the field of radiation safety - structure, functions and tasks of GOSATOMNADZOR of the MES. • SRIFSE (MES). • Main functions and tasks of the Ministry of Health of the Republic of Belarus within the national system for prevention and response to radiation emergencies. • Main functions and tasks of the Ministry of Interior of the Republic of Belarus within the national system for prevention of and response to radiation emergencies. • Main functions and tasks of the Committee of Border Security of the Republic of Belarus within the national system for prevention of and response to radiation emergencies. • Main functions and tasks of the Ministry of Defense of the Republic of

	Belarus within the national system for prevention of and response to emergencies. • Main functions and tasks of the State Customs Committee of the Republic of Belarus within the national system for prevention and response to nuclear and radiation emergencies.
Day 2 5 October	**Location: Minsk (Sosny)** **Host: Joint Institute for Power and Nuclear Research Sosny** Visit to Joint Institute for Power and Nuclear Research Sosny **Location: Minsk** **Host: Republican Center for Emergency Management and Response of the MES** Visit to the Republican Center for Emergency Management and Response. Presentation of the national capabilities on notification in case of radiation emergencies.
Day 3 6 October	**Location: Svetlaya Roshcha (Borisov district),** **Host: Institute for Retraining and Professional Development of the MES** Overview of the educational base of the Institute for Retraining and Professional Development of the MES. Overview of the training base of the IRPD, demonstration of the elements of practical training. **Location: Minsk.** **Host: Ministry of Emergency Situations of the Republic of Belarus** Discussion of the Self-Assessment with the MES.
Day 4 7 October	**Location: Minsk.** **Host: Ministry of Emergency Situations of the Republic of Belarus** Discussion of the Self-Assessment with the MES. **Location: Minsk.** **Host: Republican Special Response Team of the MES** Visit to the Republican Special Response Team (RSRT). Presentation of capabilities of the Center of Chemical and Radiation Protection of the RSRT. Independent work of the expert group, preparation of the mission report.
Day 5 8 October	**Location: Minsk.** **Host: Ministry of Emergency Situations of the Republic of Belarus** Meeting with the management staff of the Ministry for Emergency Situations of the Republic of Belarus. Final meeting with the working group, conclusions and recommendations.

2. SUMMARY OF RECOMMENDATIONS

2.1. Historical background and the current situation

The Republic of Belarus is situated in the central part of Europe. Belarus shares a border with Lithuania in the north-west, Latvia in the north, Russia in the north-east and east, Ukraine in the south and Poland in the west.

The total area of the country is 207.600 square kilometers, making Belarus the thirteenth biggest country in Europe. In terms of population (9.663.500 as of June 1, 2009), Belarus is the fifteenth most populated country in Europe.

The country is divided into six administrative territories: Brest, Vitebsk, Gomel, Grodno, Minsk, and Mogilev regions. The capital of Belarus is Minsk.

The official languages are Belarusian and Russian.

Nuclear energy program in Belarus

The development of the national energy sector is implemented in accordance with the new Concept of Energy Security of the Republic of Belarus, which covers the time period up to 2021. In order to ensure national energy security, the Concept considers the introduction of nuclear energy into the national energy mix by constructing a nuclear power plant of two reactors with a total capacity of 2400 MW before 2020. The first power unit of the Belarusian nuclear power station is scheduled to be commissioned in 2016, the second in 2018.

On July 30, 2008, the Law of the Republic of Belarus "On the use of atomic energy" (Atomic Act) was adopted. The Law sets up the conditions and the normative and legal base for the safe development of the nuclear energy sector and for the use of nuclear technologies in various sectors of the national economy, as well as for conducting research activities. In December 2008, a specially established State Commission defined the Ostrovetskaya site as the priority site for the construction of the first Belarusian NPP and two other sites were

approved as reserve ones. The distances from the centre of the site to the borders of the neighboring countries are: 23 km to Lithuania, 110 km to Latvia, and 200 km to Poland.

The research and survey activities on the priority site (Ostrovetskaya) were completed in 2009 and the Environmental Impact Assessment (EIA) report was prepared. In accordance with the ESPOO Convention, consultations and public hearings to discuss the Environmental Impact Assessment (EIA) report of the planned Belarusian NPP were conducted in Lithuania, Latvia, Poland, Austria, and Ukraine.

2.2. Outcome of the Mission

The major conclusion made by the EPREV team after gaining insight into the Belarus national emergency preparedness and response (EPR) infrastructure is, that Belarus has established a sound emergency preparedness and response capability, which however its appropriateness and functioning needs a review in view of the plans for constructing NPPs in Belarus.

The team was impressed by the dedication and knowledge of the counterpart institutions and appreciated the strong commitment to further improve the existing EPR system and to harmonize national arrangements with the international standards [2].

When considering the requirements of GS-R-2 and the relevant IAEA guidance (e.g. EPR-METHOD [3]), the authorities dealing with the EPR infrastructures in Belarus should focus on the following major tasks:

1. To foster the use, in national regulations, of the five threat categories of GS-R-2 (Table 1 of [2]) in order to implement an internationally accepted graded approach to establishing and maintaining adequate arrangements for preparedness and response to nuclear and radiological emergencies. Accordingly, a comprehensive reassessment of threats needs to be performed. It must take into account all sorts of emergencies (e.g. transport accidents involving radioactive or nuclear material, re-entry of a satellite with radioactive material aboard, terrorist attacks with radioactive materials potentially leading to large scale contamination, etc.) and any changes to the threats within Belarus, as well as emergencies beyond its borders, with a possible impact on the territory of Belarus. A summary description of a complex assessment of threats shall be included in the National Radiation Emergency Plan (NREP). (For details see paragraph 3.2 of this report).

2. To continue its efforts revising national arrangements in order to fully meet the requirements on response criteria in emergency exposure situations (Annex III of [2]) and to ensure adequate protection of workers, emergency responders and the public in nuclear or radiological emergency situations. The full implementation and adoption of the above mentioned criteria (levels) should facilitate an effective harmonization of emergency preparedness and response in the region.

3. To establish ongoing quality assurance (QA) and maintenance, as recommended in EPR-METHOD Section 2.2.2 “Step-by-Step Approach”. These are needed to ensure a high degree of availability and reliability of all supplies, equipment, communication systems, etc., and to promote a regular review of plans and procedures, as well as a review of training and exercise programs.

The institutions of the Ministry of Emergency Situations of the Republic of Belarus have very good capabilities for training emergency response staff (including fire brigades) for responding to radiological emergencies. Any further development of these capabilities may be beneficial. For example, during the visit to the National Institute for Retraining and Professional Development of MES, the team gained the impression that after certain improvements this institute could provide coordinated training in theoretical and practical skills for responding to radiological emergencies to all those needing this training in Belarus (police, custom officers) and also to the representatives of foreign countries upon their request. Therefore, considerations could be given for the use of the abovementiones facility as a national capacity building center for emergency preparedness and response.

In the rest of this chapter a summary of the major recommendations is given. These recommendations are to be followed in developing a sound emergency response system in Belarus with respect to the envisaged progressive use of nuclear energy in this country. The description of the current situation and more detailed findings are given in Chapter 3, which provides the broader background, as to why such actions are proposed.

The recommendations are divided into two groups:

- Recommendations for *interim* implementation, which should be addressed immediately in order to significantly improve the country's response capabilities using existing resources. These recommendations should be addressed as soon as possible;
- Recommendations for *longer-term* implementation that are actions pertaining to national/local response organization/coordination, which should be addressed over the longer term.

The EPREV team formulated recommendations based on its findings, which focused on areas that must be strengthened to be fully compatible with IAEA requirements [2] and guidelines [3]. Authorities from the Republic of Belarus may consult these publications for more detailed information.

2.3. Recommendations for Interim implementation

2.3.1 GOSATOMNADZOR should, within the framework of its inspection activities, observe and inspect emergency exercises of selected license holders, according to an approved inspection plan.

2.3.2 MES, in developing the corresponding regulation and amending the NREP, should introduce the use of threat categories in full compliance with GS-R-2.

2.3.3 In the national threat assessment, all sorts of emergencies (e.g. transport accidents involving radioactive or nuclear material, re-entry of a satellite with radioactive material aboard, terrorist attacks with radioactive materials involving large scale contamination, potential of melting a source hidden in scrap metal, etc.) should be included.

2.3.4 MES should, with respect to changes in operation conditions at Chernobyl and Ignalina NPPs (no heat generation in the reactors), reassess the possible threat and impact of nuclear accidents at these facilities on the territory of the Republic of Belarus and consider the necessary scope of emergency preparedness. This work could be performed in cooperation with the relevant neighboring countries.

2.3.5 Active cooperation between the operator and the local communities should be exercised even in the case of facilities with no off-site effects. A need for such

cooperation could be recognized, mainly regarding medical assistance, technical support (fire, engineer, etc.) or public communication.

2.3.6 Considering the special status of GOSATOMNADZOR, MES should consider integrating it into the national level response organization not only from the point of emergency management (MES role) but also taking into account professional knowledge of the staff (e.g. technical advisory group at national level).

2.3.7 Besides adopting the regulations on scrap metal control, it is also necessary to have cooperation with neighboring countries, when a radioactive source is sent back to the country of origin.

2.3.8 First responders (i.e., police, first aid, firefighters, and other emergency workers) should get written instructions on how to respond to a nuclear or radiological emergency. These instructions should be developed by MES and should include: recognition of the event (e.g., radiation signs, transport codes); identification of whom to call to report the event; guidance on how to secure the site and protect those on the site; the risks associated with radiation; and guidance on how to avoid potential contamination while providing first aid to the injured persons.

2.3.9 International guidance on the emergency classification system [2] should be adopted into the NREP.

2.3.10 To ensure an effective licensing process, brief guidelines should be developed by the licensing regulatory body to outline which mitigatory actions the operators of threat category IV practices should include in their instructions for coping with emergency situations.

2.3.11 The EPREV team understood that the doses received by first responders could be assessed and registered in the State Dosimeter registry (SDR). The appropriate formal procedures for record keeping and controlling the doses should be further strengthened. MH should further strengthen procedures and establish default operational levels of radiation quantities (dose/dose rate) for emergency workers for different types of response activities, which are determined in quantities that can be directly monitored by emergency workers during the performance of these activities. The operational levels should take into account all exposure pathways (such as external radiation, inhalation and ingestion).

2.3.12 MH should develop and integrate in the SDR a database of doses of first responders.

2.3.13 Each organization, which has designated emergency workers, shall designate a person (or persons) with adequate qualifications, who is responsible for the radiation protection of the emergency workers.

2.3.14 In the emergency response plans related to radiation emergencies, or in the appropriate procedures, the concept of an “inner cordoned area (safe distance) radius” shall be included as it is explained in Appendix 5 of EPR-METHOD [3]. These values are initial distances needed to prepare the area for managing radiation emergencies.

2.3.15 The good practice of developing new national safety standards (based on the IAEA recommendations: GS-R-2, GS-R-2.1, GSG-2 and revised IAEA Basic Safety Standards) is noted. Given the extended responsibilities of MH in the area of radiation protection and dose assessment (which will only increase in light of building the new NPP) the MH should consider establishing of the Center of Radiation Protection under the MH.

2.3.16 The MH should take steps to ensure that, in case of severe radiation injuries, which should be treated by specialists, a procedure is in place to promptly request assistance from the IAEA.

2.3.17 The MH would benefit from conducting national training courses on Medical Response to Radiological emergencies, based on the standard IAEA training materials.

This training may be supported by the IAEA on request from Belarus submitted through official channels.

2.3.18 Testing the capacity for informing the public must be an integral part of regular exercises. The exercise scenario should involve public communication and the media should be motivated to participate in the exercises. Alternatively, media communication should be simulated using the authorities' own teams or inviting external participants (e.g. journalism students).

2.3.19 Staff responsible for preparation and approval of press releases should be designated in advance. In addition, the information pathways should be described in the emergency response plans or their procedures, outlining to which media information should be sent, by which means (facsimile, e-mail, telephone), and identifying the responsible person to authorize and send out this information.

2.3.20 Using the advantage of new information technologies (internet), the relevant state organizations should consider extending the use of their web sites to educate the public and facilitate communication with the public using electronic communication through publicly announced addresses regarding safety and protection issues. These arrangements should also be used during an emergency situation (when possible).

2.3.21 Scenarios for testing capabilities to mitigate the non-radiological consequences of the emergency response should be elaborated and developed, according to the simulated conditions, in order to identify the potential gaps.

2.3.22 Relevant IAEA publication should be made accessible through the existing libraries and knowledge network at CEI and IRDP.

2.3.23 Professional training of emergency professionals at CEI should be expanded and include practical exercises using modern technologies of radiation measurement in the field and under emergency conditions.

2.4. Recommendations for longer term implementation

2.4.1 The scope and content of the NREP should be reviewed against the IAEA guide (EPR-METHOD 2003, [3]) and the necessary changes to reach a high level of compliance should be implemented.

2.4.2 Taking into account the new nuclear program and approval of the new site (in Ostrovetskaya) for building a nuclear power plant in the country, the NREP should be reviewed with an aim to ensure sufficient regional and national structure, necessary capabilities, and facilities and to strengthen the organization and coordination of emergency response at relevant levels.

2.4.3 Taking into account the common practice with respect to the detection of sources at border check points, the relevant organizations (MES, CBS, SCC) should consider developing a procedure to negotiate a found radiation source with foreign countries. This procedure should be integrated into the national arrangements.

2.4.4 Introducing the emergency planning zones for the future NPP in Belarus, the radius of these zones should be reviewed, taking into account the new, enhanced nuclear safety requirements on units of III+ generation and international requirements [2, 4]. The conditions for the development of off-site plans and the zones, where the implementation of protective measures may need to be applied (PAZ, UPZ), should be elaborated.

2.4.5 Taking into account the close location of the new NPP to borders, coordination with response organizations in neighboring countries should be facilitated.

2.4.6 The effectiveness of existing arrangements on providing information and issuing warnings and instruction to the public should be evaluated following a special scenario in case of a few typical facilities (model emergencies). Based on the exercise, the feedback should be the basis for further improvement of the overall conditions.

2.4.7 MH should adopt methodology for revising default OILs (IAEA TECDOC 955, GSG-2) [6, 7] in case of nuclear emergencies.

2.4.8 Agricultural countermeasures and long term protective actions should be addressed and exercised in the frame of national level exercises. (**Comment:** National level exercises typically focus on the early phase of an accident (notification, information, mitigation of consequences, and implantation of urgent protective actions) which leaves the arrangements for long term protective measures somewhat neglected.)

2.4.9 Local and international experience in responding to emergency situations involving uncontrolled radiation sources should be used to optimize response procedures and update the training program. Drills should be organized with the participation of medical response units, e.g. for the treatment of overexposed and/or contaminated patients. The IAEA could provide expert assistance in organizing and conducting such drills or exercises.

2.4.10 Maintaining the competence of all first response teams is a long-term task, requiring a well-designed training program, human resource management and exercising. The on-site and off-site local first response units, as well as local officials and other bodies responsible for responding to emergencies within the SSPEES, should be trained on radiation protection on a regular basis. The scenarios for drills and exercises should include a component of radiation emergencies. This allows for qualified personnel at local levels, who can be mobilized in case of any emergency involving the hazard of ionizing radiation.

2.4.11 A long-term (e.g. five year) nuclear and radiation emergency exercise program should be adopted to ensure that the planned frequency is respected in terms of participation, objectives and coordination with other types of exercises, etc.

3. DETAILED FINDINGS

This section presents, in full, the EPREV Team's findings and recommendations made in accordance with the scope of the review and the evaluation as stated in para.1.2 above.

The evaluation was conducted based on a) official documents provided by the local and national Government officials of the Republic of Belarus, before and during the mission (see APPENDIX 1 of this report); b) oral information obtained from the officials, as well as from the facility managers and representatives, during the meetings and subsequent discussions and interviews (for the list of the officials met during the mission see APPENDIX 3); c) analysis of the relevant materials available through official correspondence and Agency databases.

Where appropriate, the EPREV team listed interim findings indicating actions that should be taken immediately, using existing capabilities, to strengthen the emergency preparedness and response program of the Republic of Belarus. Following these recommendations for the near term findings for longer term implementation are listed pertaining to actions providing a solid foundation for an emergency preparedness and response program consistent with IAEA Requirements [2].

The following sections address main requirements of GS-R-2 [2] and the associated guidance document [3] concerning the basic responsibilities, assessment of threats, response functions and infrastructure.

3.1. BASIC RESPONSIBILITIES

Appraisal criteria [2]

- ***Establish or identify an existing governmental body or organization to act as a national coordinating authority.***
- ***Clearly assign the functions and responsibilities of users and response organizations and ensure they are understood by all response organizations.***
- ***Establish a regulatory and inspection system that provides reasonable assurance that emergency preparedness and response arrangements are in place for all facilities and practices.***

3.1.1 Current situation

The existing legislation (Law on Radiation Safety of the Public (Law 122-Z), Law on Protection of the Public and Territories in Emergencies of Natural and Man-made character (Law 141-Z), Law on the Use of Atomic Energy (Law 426-Z)) empower the Ministry of Emergency Situations of the Republic of Belarus to act as a competent authority for coordination and management of all disasters and accidents including radiation emergencies and to perform the following main functions:

- To develop legal conditions to respond to emergency situations;

- To ensure programs for the development of emergency preparedness and the establishment of the necessary facilities for emergency situations at all (state, regional, local and facility) levels;
- To ensure and control the preparedness and internal infrastructure of state bodies and organizations to respond to emergency situations;
- To establish a system for data exchange and collect data related to emergency situations;
- To perform public education for emergency situations;
- To asses consequences of emergency situations;
- To ensure the necessary expertise, regulation and control to protect the public from the consequences of emergency situations;
- To manage the forces and means involved in the mitigation of consequences of emergency situations;
- To perform and coordinate the recovery and other actions required in the event of emergency situations;
- To provide humanitarian assistance;
- To coordinate international cooperation in the area of emergency response;
- To organize training for management authorities, civil defense divisions and the public on how to act in the event of emergency situations.

The functions and responsibilities of each state body involved in emergency preparedness and response are assigned in the Resolution of the Council of Ministers on the Responsibilities of Ministries and other Authorities in the Field of Protection of the Public and Territories against Natural and Industrial Emergencies.

According to the regulation "Basic Sanitary Rules for Ensuring Radiation Safety" (OSP2002, para 273) users of ionizing radiation sources should develop and adopt a Plan of Action for Protection of Personnel and the Public in the Event of a Radiation Accident, which should assign the necessary functions and responsibilities. The Plan should be approved by the local and state authorities responsible for the management, supervision and control in the field of radiation safety.

The functions and responsibilities of the relevant response organizations in case of a nuclear or radiological emergency at a NPP in a neighboring country are determined by the National Plan for Protection of Population and Territory in case of Radiation Emergencies (NREP), approved in March 2007.

The responsibilities of organizations in case of emergencies involving orphan radioactive sources are defined in the "Regulation on the Interaction between National Government Bodies, other State Agencies and Organizations in Detecting Sources of Ionizing Radiation, as well as in the Case of their Seizure when Moving across the State Border of the Republic of Belarus", approved by the Resolution of the Council of Ministers of Belarus of 30.04.2009, No 560.

According to Article 6 of Law 122-Z, state regulation and administration in the field of radiation safety is implemented by the President of the Republic of Belarus, the Council of Ministers, the Ministry of Emergency Situations, the Ministry of Health, the Ministry of Natural Resources and Environmental Protection, Local Executive and Administrative Authorities and other state institutions and organizations under their authority provided by legislation (see APPENDIX 4)

According to Law 426-Z, The Ministry of Emergency Situations, the Ministry of Natural Resources and Environmental Protection, the Ministry of Health, the Ministry of Internal Affairs and the Committee for State Security (hereinafter referred to as state regulatory agencies) are the authorized Republic level state control agencies performing state regulation of activities to ensure nuclear safety.

The tasks of the key organizations are listed below.

The MES in the field of ensuring radiation safety within its area of responsibility**:**

- Takes measures for the implementation of state policy;
- Coordinates the activities of state administration bodies and other state institutions and organizations;
- Organizes and carries out state supervision;
- Passes regulatory legal acts in the field of radiation safety and approves and implements technical normative legal acts;
- Grants and cancels permissions for import and (or) export of ionizing radiation sources restricted for movement across the border of the Republic of Belarus;
- Decides on the complete or temporary suspension of activities regarding the use of ionizing radiation sources and the operation of radioactive waste management facilities until identified violations of law, normative legal acts or technical normative legal acts in the field of radiation safety are eliminated;
- Establishes the procedure of development, agreement and approval of a centralized system of radioactive waste management;
- Establishes the procedure for transportation of radioactive waste;
- Controls other authorities in accordance with the current law and other acts of legislation.

According to the Law 426-Z, Chapter 7 (Law on the use of Atomic Energy), the MES shall, within the scope of its power:

- Implement state supervision to ensure nuclear safety and radiation protection, and be responsible for providing physical protection of items used in atomic energy;
- Organize and implement state supervision of the management of spent nuclear fuel and operational radioactive waste;
- Control compliance with the law to ensure nuclear safety and radiation protection;
- Participate in the organization of the work and of the assessment of the performance to evaluate compliance of the equipment, products and processes for items used in atomic energy;
- Ensure the functioning of a single state system of accountancy for ionizing radiation sources and for nuclear materials;
- Organize expert appraisals on the safety of nuclear installations and/or storage facilities, including the involvement of independent experts.

In accordance with the “Decree of the President of the Republic of Belarus Regarding Certain Measures on NPP Construction” (No 565, November 12, 2007) the Department on Nuclear and Radiation Safety of the Ministry for Emergency Situations was established as the National Nuclear Regulatory Authority - GOSATOMNADZOR, regulator “de facto” and “de jure” with the rights of a legal entity and delegated rights for fulfilling regulatory functions.

The main tasks of GOSATOMNADZOR are:

- State supervision in the field of ensuring nuclear and radiation safety;
- Ensuring compliance of legislation in the field of nuclear and radiation safety.

Within the main functions of GOSATOMNADZOR (Order on the Department for Nuclear Safety and Radiation Protection of the Ministry for Emergency Situations of the Republic of Belarus, Chapter 3), the regulatory role is clearly defined in line with international practice.

Because of historical reasons and the scope of the Chernobyl accident, activities related to coping with the consequences in a radiation emergency are the responsibility of the Department for Elimination of Consequences of the Catastrophe at the Chernobyl NPP of MES. The main duties of the Department are to develop legal documents and control management of radioactive waste of Chernobyl origin.

The main roles of other State Authorities responsible for radiation safety (see also APPENDIX 4) are described below:

a) The Ministry of Health is a state regulatory body responsible for the development and introduction of sanitary norms, rules and regulations on radiation safety and sanitary control, issuing permissions (sanitary passports) for use of radioactive sources and waste, controlling radiation doses of personnel and the public and creating a united state system of accounting for and controlling individual exposure doses.

b) The Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (MNREP) carries out radiation monitoring of the environment (air, water, soil) and radiation monitoring in regions at risk of possible radiation contamination sources. This includes monitoring to assess the trans-boundary release of radioactive substances, monitoring radioactive contamination of air, soil, surface and ground water in areas contaminated as a result of the catastrophe at Chernobyl NPP, carrying out forecasts of the spread of radioactive contamination in case of possible emergencies, organizing the operative radiation control over the environment to detect the contamination of the environment in the consequence of a radiation emergency and informing the corresponding state regulatory bodies and the local executive and administrative authorities in order to prevent and mitigate the impact of a radiological emergency situation. The interaction between the MES and the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus ensures information exchange and conducts arrangements for the case of emergency preparedness).

c) The National Commission on Radiation Protection under the Council of Ministers of the Republic of Belarus is a consultative and expert body in the field of radiation safety, security and control.

d) The Committee on Standardization, Metrology and Certification under the Council of Ministers of the Republic of Belarus accredits the laboratories and radiation control stations, attests the methods of performing radiological measurements, and executes the verification and metrological certification of measuring devices.

e) The National Academy of Sciences of the Republic of Belarus carries out the scientific maintenance of works on developing technologies and safety assurance in the field of radioactive waste management and takes part in the development of the corresponding legal basis.

The regulatory and inspection system is operational. It ensures that all facilities/practices must have their verified emergency plan in place. Compliance with emergency preparedness requirements is inspected at different levels of the licensing process and operation by inspectors of the GOSATOMNADZOR and by inspectors of the regional divisions of MES and of the MH.

3.1.2 Good practice

1. Competencies of the MES, both in the nuclear regulatory role and the role of the competent authority for coordination and management of all disasters and accidents, enable an effective coordination and control of arrangements for preparedness and response to a nuclear or radiological emergency.

3.1.3 Findings

Interim

1. GOSATOMNADZOR should, in the framework of inspection activities, observe and inspect emergency exercises of selected license holders according to an approved inspection plan.

2. MES, in cooperation with MH, should continue the promotion and the transfer of the principles of international standards [2] into national conditions in the field of emergency preparedness and response to nuclear or radiological emergencies.

3. The good practice of developing new national safety standards (based on the IAEA recommendations: GS-R-2, GS-R-2.1, GSG-2 and revised IAEA Basic Safety Standards) is noted. Given the extended responsibilities of MH in the area of radiation protection and dose assessment (which will only increase in light of building the new NPP) the MH should consider establishing of the Center of Radiation Protection under the MH.

Long term

3. The scope and content of the NREP should be reviewed against the IAEA guide (EPR-METHOD [3]) and necessary changes to reach high level of compliance should be implemented.

3.2. ASSESSMENT OF THREATS

Appraisal criteria [2]

- ***Perform threat assessments of the State's facilities and activities, and categorize them in accordance with the five threat categories in Table I of GS-R-2.***

3.2.1 Current situation

Part II, Chapter 9 (Classification of radiation facilities according to the potential danger) of Basic Sanitary Rules for Ensuring Radiation Safety (OSP-2002) establishes classification of nuclear and radiation facilities based on the level of their potential radiation hazard for workers and for the public. The four defined categories in para 40 ("…On potential radiation hazards there shall be four categories of objects") are used to establish regulatory requirements for designing, siting and construction of radiation facilities, including requirements on the arrangements for emergency response actions, which should be part of the documentation required for the license process.
The legislation requires having threat assessments done for facilities, when applying four categories defined by para 41-44 as:

Category I: Emergencies with possible radiation consequences off the site and where protective measures of the public are expected off-site.
Category II: Emergencies with possible effects beyond the territory (beyond "on-site") of the facility but limited to the sanitary zone.
Category III: Site area emergencies, where radiation consequences could be on the site area of the facility.
Category IV: Facility emergencies, where radiation consequences are limited to the facility building.

Threat assessments of facilities and activities are performed by the relevant state authorities responsible for the state regulation and supervision (MES, MH) and by the user/license holders in the framework of preparedness and plan development. The comparison of definitions (OSP-2002 and GS-R-2) shows that these assessments are not fully in line with the threat categories introduced by GS-R-2. The OSP-2002 also requires that design documentation of the facility must include the list of potential radiological accidents and that the emergency plan must be consistent with the threat presented by the potential accidents. The development of emergency plans is coordinated with the MES and other relevant bodies and authorities.

The National Registry of Radiation Sources has been completed and is under the control of the MES (GOSATOMNADZOR). MH has its own records regarding facilities and radioactive sources, used or stored on the territory of the Republic of Belarus. Special arrangements are in place regarding the possible impact of the closest nuclear power plants (Category I facilities) in Russia, Ukraine and Lithuania.

A brief assessment conducted by the EPREV mission determined the following threat categories, according to Table 1 of GS-R-2.

<u>Threat category III</u>

1. Threat category III includes facilities, for which events are postulated that could give rise to high doses to people on the site and would not warrant urgent protection action off the site [2]. Examples are gamma-therapy facilities, operated at regional Oncology Centers (6) and facilities at the Joint Institute for Power and Nuclear Research "Sosny":

    - Gamma irradiation facility UGU-420 (Category II according to the OSP-2002)

- Gamma irradiation facility UGU-10
- Gamma irradiation facility RXM-gamma-20 (Category III according to the OSP-2002)
- Spent fuel storage, fresh fuel storage, subcritical assembly "YALINA", critical assembly "GIACINT", isotope laboratories 02, 04, 05, 06, 13, 14 (Category III according to the OSP-2002)

Threat category IV

Threat category IV represents the minimum level of threat, which applies to all States and jurisdictions. This includes the activities which could give rise to a nuclear or radiological emergency that could warrant urgent protective actions in an unforeseeable location. For example transport of dangerous sources, activities related to non-authorized use of dangerous sources, illicit trafficking, and detonation of a radiological dispersal device (RDD)[2].

Based on past experience in Belarus, it appears that incidents with activities in this category (e.g. transit trafficking of contaminated scrap metal) are the most likely scenario for the Republic of Belarus. Certain experiences also include radioactive sources found at former military areas, where no documentation or information for regulatory purposes were available.

Threat category V

This includes activities not normally involving sources of ionizing radiation, but yielding products likely to become contaminated to levels necessitating their prompt restriction. Such contamination may result from emergencies at facilities of threat category I or II in other states. This has a noticeable probability of occurrence on the Belarus territory because of the close facilities in neighboring countries. Existing arrangements and agreements with Russia, Ukraine and Lithuania enable a higher level of readiness for these possible situations. With respect to the Belarusian experience with the Chernobyl accident, special arrangements (including the preparedness for iodine prophylaxis measures) are implemented regarding the planning zones in the directions of the 4 main NPPs – Chernobyl, Smolensk, Ignalina and Rovno.

3.2.2 Good practice

1. In spite of the fact that there is no category I or II nuclear facility on the territory of the Republic of Belarus, it is essential that the emergency preparedness and national readiness consider the possible effects of these facilities operated on the territory of neighboring countries and ensure necessary arrangements for a possible response, including implementation of protective measures against possible transboundary effects.

3.2.3 Findings

Interim and Long term

1. MES, developing the corresponding regulation and amending the NREP, should introduce the use of threat categories in full compliance with GS-R-2.

2. The current legislation (OSP-2002) requiring threat assessment is a facility oriented regulation; it does not categorize activities that could give rise to a nuclear or radiological

emergency in an unforeseeable location (Threat category IV of GS-R-2). In this context MES, in cooperation with MH, should develop procedures to introduce criteria for this category.

3. In the national threat assessment all sorts of emergencies, (e.g. transport accidents involving radioactive or nuclear material, re-entry of a satellite with radioactive material aboard, terrorist attacks with radioactive materials involving large scale contamination, potential of melting a source hidden in scrap metal, etc.) should be included.

4. In the national threat assessment, attention should be given to identification of the locations at which there is a significant probability of encountering a dangerous source that has been lost, abandoned, illicitly removed or illicitly transported.

5. MES should, with respect to changes in operation conditions at Chernobyl and Ignalina NPPs (no heat generation in the reactors), reassess the possible threat and impact of radiation accidents at these facilities to the territory of the Republic of Belarus and consider the necessary scope of emergency preparedness. This work could be performed in cooperation with relevant neighboring countries.

6. In the framework of the quality assurance and maintenance program of the NREP, the threat assessment should be reviewed and repeated, if and when necessary, with certain regularity and as a part of the license review process, to maintain a relevant up-to-date perception of the potential risk and to make the necessary changes in the emergency plan if necessary.

3.3. ESTABLISHING EMERGENCY MANAGEMENT AND OPERATIONS; AUTHORITY, ORGANIZATION, AND COORDINATION OF EMERGENCY RESPONSE

Appraisal criteria [2]:

- ***Make arrangements to coordinate the emergency response of all the off-site response organizations with the on-site response to include a command and control system for the local and national response to any nuclear or radiological emergency***

3.3.1 Current situation

The command and control system for the local and national response, to any emergency in the territory of the Republic of Belarus, is an integral part of the State System for Prevention and Elimination of Emergency Situations (SSPEES). The SSPEES integrates a) republic state bodies carrying out management in the field of the prevention and mitigation of emergency situations, maintenance of industrial, fire and radiation safety, b) civil defense and c) other support state organizations, d) local executive and administrative bodies taking part in planning, organizing and implementing actions to protect the population and territories against emergency situations of natural and man-made character and preparing to perform actions in the area of civil defense.

The system is organized and operates according to the "Resolution of the Council of Ministers of the Republic of Belarus on State System for Prevention and Elimination of Emergency Situations", 2002, No 495. The system consists of permanent branches and territorial

subsystems. Structures are at state, regional, local and enterprise levels. Every level of the SSPEES has coordinating organs - territorial and branch Commissions for Emergency Situations (CES). The Commissions are authorized to provide the necessary transport, rescue, firefighting, medical, technical and other forces and also to use material reserves and all communication systems existing in the territories under their jurisdiction. In the event of an emergency, forces and means of regional, local and enterprise-level subsystems are subordinated to the national governmental bodies of the respective territorial subsystems.

Principal decisions related to prevention and elimination of emergencies are taken by the Commission for Emergency Situations under the Council of Ministers of the Republic of Belarus. This commission disposes of a fund allocated annually in the state budget for the mitigation of emergency situations.

The organizational chart of the SSEPEES is given in APPENDIX 6.

The role of state organizations and their involvement and coordination within the SSPEES, are described in the NREP (Chapter 3, 4 and 5), which is part of the Plan for Protection of the Public from Natural and Man-made Emergency Situations in Belarus (the all-hazard approach in place).

The MES is an executive body of the SSPEES controlling and managing in the area of prevention and elimination of natural and man-made emergency situations and providing fire safety.

Roles, functions, authorities and responsibilities of all the operating parts, ministries and national organizations acting within the framework of the SSPEES are documented in accordance with the above mentioned Resolution of the Council of Ministers of the Republic of Belarus No 495.

The main state institutions within the SSPEES and their key roles are as follows:

Ministry for Emergency Situations

- coordination activities
- information collection
- safety control
- provision of information to the mass media

Ministry of Health

- participation in definition of contamination levels, in control of individual doses
- estimation of medical consequences
- medical assistance to population

Ministry for Environment

- estimation of radiation situation
- providing hydro-meteorological information

Ministry for Internal Affairs

- organization of access and guarding
- provision of information for MES

Ministry of Defense
- participation in emergencies with radiation sources on the territory of military settlement

State Custom Committee, National Border Committee
- preliminary estimation of radiation risk
- measures for prevention risks
- organization of guarding

National Academy of Science
- on-call preparedness of a special laboratory for radioactive sources identification
- expertise on radioactive sources
- transport and storage of nuclear materials

Intelligence Service
- investigation of crime and emergencies with radiation sources

Local executive bodies
- provision of information to the public about the radiation situation

Organizations with corresponding licenses
- identification, requisition, transport and storage of radioactive sources
- participation in deactivation activities.

It should be noted that the SSPEES has been established on the basis of an all-hazards concept, the infrastructure is used for any type of emergency, and the management staff will depend on the specific emergency.

3.3.2 Good practice

1. In spite of the fact, that the legal conditions did not fully adopt the international recommendations [e.g. [2]], arrangements for response to a nuclear or radiological emergency implement an integrated planning concept (the National Radiation Emergency Plan is part of the National (all-hazards) Emergency Plan) and facilitate an optimal use of available resources and a high level of preparedness.

2. The established cooperation and exchange of information between the Republican Centre of Emergency Management and Response of the MES and partner organizations in neighboring countries operating nuclear facilities of category I, fully meet expectations of the regional cooperation according to the Convention of Early Notification of a Nuclear Accident and IAEA guidance.

3.3.3 Findings

Interim

2. Active cooperation between the operator and closest communities should be exercised even in case of facilities with no off-site effects. A need for such cooperation could be still be necessary, mainly regarding medical assistance, technical support (fire, engineer, etc.) or public communication.

3. Considering the special status of the GOSATOMNADZOR, MES should consider integrating it into the national level response organization, not only from the point of emergency management (MES role) but also taking into account professional knowledge of the staff (e.g. technical advisory group at national level).

4. With respect to a prepared transport (end of 2010) of spent fuel from SOSNY to the Russian Federation, the MES, in cooperation with a licensee, should document the real course of actions and use it as basis for a scenario for a simulated transport accident in the future.

5. In the framework of the information exchange between organizations regarding ionizing radiation (activities, levels, doses and dose rates), the internationally accepted units (Sv, Gy, Bq) should be used.

Long term

1. Taking into account the new nuclear program and approval of the new site (in Ostrovetskaya) for building a nuclear power plant in the country, the NREP should be reviewed with an aim to ensure sufficient regional and national infrastructure, necessary capabilities and facilities are available and to strengthen the organization and coordination of emergency response at relevant levels.

2. Long-term goals in emergency management and operations are associated with the feedback of lessons learned from exercises and real events. It is necessary that the plans are reviewed with a pre-defined frequency (e.g. every three years) and potential organizational changes are also considered, not only new or different equipment, more manpower, better and revised procedures, more training, etc. The top decision makers should be included in this process.

3.4. IDENTIFYING, NOTIFYING AND ACTIVATING

Appraisal criteria [2]:

- ***Establish 24 hours/day, 7 days/week contact point.***
- ***Raise awareness of radiological hazards for on-site managers of facilities (e.g. scrap metal processing facilities) and national border control authorities.***
- ***Make sure first responders are aware of: the symptoms, the appropriate notification and other immediate actions warranted if an emergency is suspected.***
- ***Establish a system for promptly initiating an off-site response in the event of an emergency.***
- ***Ensure response organizations have sufficient personnel.***
- ***Make known to the IAEA and other States the State's single warning point of contact responsible for receiving emergency notifications and information from other States and information from the IAEA.***

3.4.1 Current situation

There is a national 24 hours/day and 7 days/week point of contact established in the Republican Emergency Management and Response Centre (REMRC) of the MES to receive notifications of any actual or potential emergencies. This center has been designated as the single warning point of contact responsible for receiving/ and sending emergency notifications and information from/to other States and to be the Contact Point (CP) with the IAEA under the Convention on Early Notification of a Nuclear Accident.

The REMRC has dedicated communication with 103 contact points operating at a regional level with a special phone number (101). According to bilateral agreements with neighboring countries the REMRC is also a focal point in communication during emergencies of regional scope and these arrangements are regularly exercised. The last exercise (22-23 September 2010) was held with Russia following an emergency scenario at the Smolensk NPP.

The Early Warning System is in operation and run by the Republican Centre of Radiological Control and Monitoring (RCRCM) of the Ministry of Natural Resources and Environmental Protection. The network of regular environmental monitoring consists of 60 locations for measuring gamma dose rate, including 4 automated systems in the zones of influence of Chernobyl, Smolensk, Rovenska and Ignalina NPP: 30 locations analyzing of fallout from the atmosphere, 6 locations measuring of radioactivity in aerosols and 5 hydrological stations monitoring radionuclides in surface waters. Radiation data from the early warning monitoring systems are available on a daily basis (if there is no emergency requiring data with a higher frequency).

The control of radioactive and nuclear materials at the state borders is well established. All national border crossings are now equipped with systems of radiation control. The units of the Committee of Border Security (CBS) are equipped with necessary hand-held equipment to detect radiation and for special cases a mobile laboratory is available. For all available equipment, trained staff has been assigned. According to available statistical data for 2008-2010, on average, about 150 cases with dose rates above the background were identified annually and there were about 5 cases when the entrance was forbidden each year. In addition to the existing controls of the CBS the State Custom Committee (SCC) operates the Radiation Control (system) at the border checkpoints. In case of road checkpoints (24) 10 out of 24 are equipped with portal monitors, in case of railway checkpoints (16) 1 out of 16 is equipped with portal monitor RADOS (Pedestrian) M5000-10. Systematic control is based on automatic data transfer from portal monitors. Based on operational experiences, typically construction materials (for example, gravel), potash fertilizer and ore, television tubes, scrap metal, food (e.g. berries, mushrooms), contamination of truck wheels by mud (important for the Belarus-Ukraine border area which is close to Chernobyl) generate alarms. For mobile measurements POLIMASTER instruments are in use (PM1401/PM1401M, PM1401GN/1703GN, and ATOMTEX AT6101). To comply with international recommendations Belarus has participated also in programs designed for the improvement of control of radioactive materials (Second Line of Defense Program (US DOE) and the International Counter Proliferation Program (US DOD).

Scrap metal processing facilities are obliged to conduct measurements of the radioactivity level of collected material. Designated staff should be trained in measuring radiation and in detection of radioactive materials, which are controlled by GOSATOMNADZOR and MH. The Hygienic Requirements for Ensuring Radiation Safety during the Collection and Sale of

Metal Scrap (in force since 2003), is the most relevant legal act. The requirements establish that the authorities responsible for supervision and enforcement are MES (GOSATOMNADZOR) and MH (Centers of Hygiene, Epidemiology and Health protection).

Resolution 30.04.2009 N 560 of the Council of Ministers of Belarus on the interaction between national government bodies, other state agencies and organizations in detecting sources of ionizing radiation, as well as in the case of their confiscation when moving across the state border of the Republic of Belarus (Resolution 560) defines the responsibilities of the on-site managers and the relevant state authorities concerning immediate response actions in case a dangerous source is detected.

In most cases, first response actions are performed by the personnel of the MES rescue teams, which are aware of the symptoms and immediate actions warranted if an emergency is suspected. The professional training for MES staff is conducted by the Command Engineering Institute (CEI) and by the Institute for Retraining and Professional Development (IRPD) operated under the MES. IRPD also provides training courses, including issues of radiation protection to other (non-MES) groups of first responders (medical, police) from other state departments

In the case of a radiation accident involving the potential release of radioactive material, MES implements the followings:

- Collects meteorological and monitoring data, estimates the scope of the emergency situation and prepare the forecast of possible radioactive contamination;
- Informs the Council of Ministers of Belarus, the State Secretary of the Security Council of Belarus, the Intelligent Service, the Ministry of Health, the Office of Public Prosecutor of Belarus etc;
- Following the decision of the Prime Minister, MES notifies and activates the Commission for Emergency Situations under the Council of Ministers and notifies the population;
- Prepares recommendations on protective actions;
- Prepares and activates forces and means including a network of supervision and laboratory control.

3.4.2 Good Practice

1. The REMRC is continuously available and has reliable communication channels to receive a notification or request for assistance and has the appropriate procedures in place for processing this information in a prompt and proper manner. This allows prompt identification of the situation and activating a preplanned and coordinated response appropriate for the level of emergency.

2. MES rescue teams, and other staff that may be first on the scene in case of an accident with radioactive material, are trained to have sufficient knowledge regarding the presence of radiation and immediate actions to be taken if a higher level of radiation is suspected.

3. The IRPD program for retraining professional fire-fighters includes classes and special drills on how to detect the presence of radioactive materials and how to respond to transport and other emergencies in case such materials are involved.

4. The national Early Warning System consists of 60 measuring stations and is fully operational. Such a system provides an independent notification in case of a nuclear accident abroad.

3.4.3 Findings

Interim

1. With respect to the worldwide negative experience with scrap metal handling and improved international business in this area, MES and MH are advised to make arrangements to ensure broader education and training of scrap metal facilities staff. Information on basic signs, symbols, design, type of shielding, shape and behavior of encapsulated sources should be delivered to all staff of these facilities.

2. Besides adopting the regulations on scrap metal control, it is also necessary to cooperate with neighboring countries when a radioactive source is sent back to the country of origin.

3. MES response teams taking part in first response seem to have sufficient knowledge regarding the presence of possible radiation in case of accidents. MH, MI, CBS, SCC and other interested organizations should benefit from existing MES educational capabilities (e.g. IRDP) to extend the scope of training of their groups taking part in first response actions.

4. In the framework of emergency preparedness, in addition to a sustainable training program for first responders, the relevant organizations (MH, MES, MI, CBS, SCC and other interested organizations) should ensure availability of basic (mobile) equipment for detection of ionizing radiation for these groups.

5. First responders (i.e., police, first aid, firefighters, and other emergency workers) should get written instructions on how to respond to a nuclear or radiological emergency. These instructions should be developed by MES and include: recognition of the event (e.g., radiation signs, transport codes); identification of whom to call to report the event; guidance on how to secure the site and protect those on-site; the risks associated with radiation; and guidance on how to avoid potential contamination while rendering first aid to injured persons.

6. The situation regarding the use of emergency classes was not discussed in full scope, but according to limited information it seems that the emergency classification according to GS-R-2, para. 4.19 [2] has not been implemented. In this context it is recommended that the international guidance on emergency classification system [2] be adopted in the NREP.

Long-term

1. Taking into account the common practice with respect to possible detection of sources at border check points, the relevant organizations (MES, CBS, SCC) should consider developing a procedure to enable a negotiation with foreign countries when a radiation source is found, and this procedure should be integrated in the national arrangements.

3.5. TAKING MITIGATORY ACTION

Appraisal criteria [2]:

- ***Make arrangements to provide expertise and services in radiation protection promptly to local officials and first responders responding to actual or potential emergencies involving facilities in threat category IV.***
- ***The operator of the facility in threat category IV should be given basic instruction.***
- ***Make arrangements to initiate a prompt search and issue a warning to the public in the event of the loss of a dangerous source.***
- ***Make arrangements for mitigatory action to prevent an escalation of the threat; to return the facility to a safe and stable state; to reduce the potential for releases of radioactive material or exposures; and to mitigate the consequences of any actual releases or exposures.***

3.5.1 Current situation

All necessary information concerning the response and notification are included in the on-site emergency response plan, which any operator of a practice in threat category IV has to develop according to the legislation.

The relevant arrangements in case of an accident involving a radiation source or detecting a source at a Belorusian border are established by the Regulation on the Interaction between National Government Bodies, other State Agencies and Organizations in detecting Sources of Ionizing Radiation, and approved by the Resolution No. 560 (2009) of the Council of Ministers.

The expertise and services in radiation protection to local officials and first responders can be promptly provided by the appropriate institutions of the Academy of Science and the Ministry of Health.

The above mentioned regulation (Resolution No. 560) determines the goals, tasks and order of interactions in detecting, depositing and controlling radiation sources on the territory of Belarus. Principles on interaction include the following actions:

- Maintaining an effective coordination of actions in case of detection of ionizing radiation sources;
- Effective use of forces, means and material resources as well as knowledge and experience of the state bodies and other organizations;
- Decreasing the probability of damage to the population and to the environment as a consequence of incorrect actions with ionizing radiation sources;
- Protection and special preparation of involved workers;
- Improving the readiness of organizations and citizens to respond to cases of detection of sources of ionizing radiation;
- Fulfilling international obligations.

The Law on Use of Atomic Energy stresses the need to take mitigatory actions (Chapter 7,

para 29 (2)). According to this legal requirement in case of a radiation accident related to the use of nuclear energy, which leads to a release of radioactive substances into the environment at a level above the limits, the operating organization must:

- Immediately notify the public, state regulatory agencies and local government agencies in the emergency response area and other state agencies;
- Take steps to eliminate, restrict or mitigate the consequences of the radiation accident;
- Monitor the dose of individuals involved in works related to elimination, restriction or mitigation of the consequences of the radiation accident and also protect individuals from high doses;
- Ensure that there is continuous monitoring of the release of radioactive materials into the environment;
- Provide the relevant state agencies, other organizations and the public in the protective action zones with updated information on the radiation conditions in accordance with the emergency plans;
- Perform other duties in line with the measures envisaged in the external (off site) and internal (on site) emergency plans and in the Law on Use of Nuclear Energy.

Arrangements are in place for handling emergencies involving dangerous orphan sources. The MES special team is equipped with all necessary protection equipment and was trained to undertake emergency response in hazardous conditions. The Center of Chemical and Radiation Protection of the Republican Special Response Team (RSRT) of the MES was created in 2006 with the aim to:

- Eliminate consequences of emergency situations involving chemical and radioactive substances;
- Carry out rescue operations in zones of chemical and radiating contamination;
- Participate in organization and maintenance of the emergency preparedness for chemical or radioactive accidents;
- Perform organizational and methodical management of chemical and radiation service.

In October 2008 the RSRT staff liquidated the storage of spent radioactive sources, located on the former military site KOLOSOVO. The IAEA supported this operation within the framework of a national technical cooperation project.

According to regulation, an operator should immediately notify the MES, GOSATOMNADZOR of any loss of radioactive material. Instructions are included in on-site emergency response plans, which have to be developed by any operator dealing with a dangerous radioactive source. According to the regulation (OSP -2002) the on-site emergency response plan of the facility shall describe the appropriate mitigatory actions and procedures. The off-site mitigatory actions are considered in the NREP (2007).

3.5.2 Good practice

1. The response actions in case of loss of a dangerous radiation source or detection of an orphan source, including illicit traffic on the national borders are established by special regulation and approved by the Council of Ministers of the Republic of Belarus.

2. The Center of Chemical and Radiation Protection of the RSRT (MES) has been equipped with all necessary protection equipment and its staff has excellent professional skills to respond to various types of radiation emergencies, including those with dangerous radioactive sources.

3. The responsibility for providing expertise and services in radiation protection to local officials and first responders is identified in the relevant Governmental Regulation. The Joint Institute for Power and Nuclear research – Sosny has nuclear safety experts, relevant measurements equipment and analytical laboratories to provide expert service and assessment of threats involving radioactive and fissile materials.

3.5.3 Findings

Interim

1. The emergency plans of local authorities as well as instructions for first responders should include a detailed procedure on how to obtain expertise and assistance for dealing with different radiological aspects in case of an emergency, including category IV accidents.

2. To ensure an effective licensing process, brief guidelines should be developed by the licensing regulatory body to outline which mitigatory actions the operators of threat category IV practices should include in their instructions for coping with emergency situations.

Long term

1. MES (GOSATOMNADZOR) in cooperation with MH, MI and other relevant organizations should make arrangements for drafting and issuing basic instructions (guidance) for first responders and the operators of the facilities in threat category IV to mitigate consequences and to prevent an escalation of the threat, particularly in transport related emergencies and suspected illicit trafficking.

3.6. TAKING URGENT PROTECTIVE ACTION

Appraisal criteria [2]:

- ***Adopt national intervention levels for taking urgent protective actions in accordance with international standards.***
- ***Make arrangements for effectively making and implementing decisions on urgent protective actions to be taken off-site.***
- ***Make arrangements to ensure the safety of all persons on the site in the event of a nuclear or radiological emergency.***

3.6.1 Current situation

Generic intervention and action levels are introduced in the national regulation NRB-2000 (see APPENDIX 7 of this report). Action levels of dose for acute exposure by organs or tissue, at which intervention is expected to be undertaken under any circumstances, are defined in full compliance with internationally accepted values.

Generic Action levels for foodstuffs (Attachment 8 of NRB-2000) are identical to the values given in Table III-I of GS-R-2 [2] but there is no reference to Ru-103, Ru-106, Sr-89, PU-240 and Pu-242 and there is no reference to more sensitive subgroups (milk, infant food and drinking water).

Generic intervention levels (GILs) in the early phase of a radiation emergency (Attachment 6 and 7) are specified for two (A and B) levels. If avertable dose is higher than the corresponding "A" intervention level but lower than that, identified as "B" level, a protective action may be taken or not, depending on the situation and taking into account optimisation and justification principles. If avertable dose is equal or higher than the corresponding "B" level, appropriate protective actions shall be taken even if they may disrupt the normal activities and the economic and social functioning of the territory.

In general Belarus GILs are comparable with the international standards reflecting national conditions after the Chernobyl accident, but not exactly the same as those in the Annex III of the GS-R-2.

Currently, in relation to the new nuclear program, a revision and amendment process of existing interventional levels has been started. According to already implemented, ongoing or planned processes the radiological criteria to respond to nuclear or radiological emergencies have been reviewed in order to get more compliance with internationally expected conditions. For example, hygienic requirements for the design and operation of nuclear power plants (SP NPP-2010), approved in 2010, establish (or revise):

- General intervention levels in case of emergencies taking into account minimization of deterministic radiation effects
- Recommended level of dose for emergency workers
- Radius of zones of planned protective measures (for planned NPP)
- Generic action levels for foodstuff, which are in full compliance with GS-R-2 and GSG-2.

Currently, the Republic of Belarus has no facility in threat category I or II, therefore off-site urgent protective actions from domestic facilities are limited.

The most likely accident which may require taking urgent protective actions could be linked to the following situations:

- General emergency with extensive off-site effects at nuclear facilities in neighboring countries; within short distances there are 4 sites, where nuclear accidents could affect the territory of Belarus.
- Facility emergencies at installations using highly active radiation sources;
- Loss of a radioactive source;
- Illegal trafficking of nuclear or radioactive materials;
- Malicious use of nuclear or radioactive materials;
- Transport accident involving nuclear or radioactive materials.

The appropriate arrangements with respect to urgent protective actions in case of an emergency at an NPP in a neighboring country are included in the NREP (2007). Instructions are in place regarding the implementation of iodine prophylaxes in case of radiation emergencies at nuclear facilities.

The licensees are responsible for ensuring the safety of all persons on the site and that appropriate arrangements are part of the Emergency Response Plan. The Plan has "Instruction on Actions of the Personnel in the Event of Emergency Situations". The licensees are responsible for ensuring availability of the appropriate alarm systems, protection and communication means, etc. The on-site emergency plans are part of the documentation required during the license process and the regulatory bodies (GOSATOMNADZOR, MH) are regularly inspecting arrangements at license holders in the framework of the regulatory control practice.

The emergency management at facilities with higher potential risk was reviewed during the visit at SOSNY. The plans were made available to the EPREV team. Plans are regularly reviewed, exercised and inspected by authorities having regulatory and control authority. An example of a plan (content) has been included in APPENDIX 10. These plans follow the legislation (OSP-2002, NRB-2000) and address the response actions regarding the safety of staff and people on-site.

3.6.2 Good practice

1. The legislative process of adopting the internationally recommended levels for protecting personnel and the public (in recent years) accelerates the harmonization process in the area of emergency preparedness and response.

3.6.3 Findings

Interim

1. The MES and MH, according to their regulatory and control functions, should follow and evaluate the adoption of new intervention levels in emergency plans and procedures of operators and relevant response organizations.

Long term

1. Introducing the emergency planning zones for the new build NPP in Belarus, the radius of emergency planning zones (PAZ, UPZ) should be reviewed and revised based on international requirements (GG-R-2, GS-G-2.1) [2,4]. The revision should take into account the new enhanced nuclear safety requirements on units of III+ generation.

2. Taking into account the close location of the new NPP to international borders, coordination with response organizations in neighboring countries should be facilitated.

3.7. PROVIDING INFORMATION, ISSUING WARNINGS AND INSTRUCTIONS TO THE PUBLIC

Appraisal criteria [2]:

- ***Make arrangements to provide prompt warning and instruction to the permanent, transient and special population groups or those responsible for them and to special facilities in the emergency zones upon declaration of an emergency situation.***

3.7.1 Current situation

The arrangements to provide information and issue warnings and instruction to the public are included in the NREP (2007).

According to Chapter 4.10 of the NREP the public in relation to radiation emergencies should be informed and warned about radiation emergencies in the following ways:

During the period before the emergency (in advance):

- Information about radiation risks, ways of notification and provision of information, ways to get additional information; planned protective measures; response for different groups of the public should be provided. (Urgent) Information should be provided through TV and radio broadcast from the Government, MES, Ministry of Health, and National Committee on Radiation Protection.
- Standard texts of this information and presentations should be prepared in advance and should be completed according to the actual situation. Following this information, educational films should demonstrate what the population should do.

During the emergency:

- For warning of the public, sirens, mobile loudspeakers, local TV and radio broadcasting, distributing leaflets and advertisements containing information about the character and order of public response – should be used. Over the next few days and weeks information should be updated several times a day.
- A single press-point (Public Information Office) to make available timely and concrete information for the public on the situation and on protective measures should be established in the region of the accident.

The local population should be informed about rules in affected areas and the status of the emergency and its consequences using available loudspeaker and mobile loudspeaker means.

To fulfill tasks on providing information, warning and instructions to the public, available communication facilities of the Ministry of Communication and Informatics, MH, MI, and MES (etc.) should be used.

3.7.2. Findings

Interim (as well as longer term)

1. Testing the communication means intended for informing the public in case of the radiation emergency must be an integral part of regular drills and exercises.

2. Issuing warnings to the transient and special population should be addressed in the emergency plans.

3. There are no facilities of category I or II recognized with possible off site effect on population of Belarus. Even so, in the case of the Joint Institute for Power and Nuclear

research – Sosny communication with the closest communities and cities should be (re)established to ensure high level of coordination of on site and off site response. Prompt notification and provision of information could effectively contribute to the elimination of any non-radiological consequences of a radiological emergency.

Long term

1. The effectiveness of existing arrangements on providing information and issuing warnings and instruction to the public should be evaluated in an exercise following special scenarios involving a few typical facilities (model emergencies). Based on the exercise, the feedback should be the basis for further development of overall conditions.

3.8. PROTECTING EMERGENCY WORKERS

Appraisal criteria [2]:

- ***Make arrangements for taking all practicable measures to provide protection for emergency workers and response personnel.***

3.8.1 Current situation

The Act on the Use of Atomic Energy stresses the need (Chapter 7, Art 29 (3)) for protection of workers during emergencies.

Doses to workers of the operating organization that are above established dose limits may be allowed only when work is carried out to eliminate, restrict or mitigate the consequences of a radiation accident (but not above the relevant dose limits for specific activities). This should only be done if there is no other possibility to protect the public or prevent large doses, or where there is a threat of major radioactive contamination of the environment. The operating organization must give information to workers taking part in such activities of the potential radiation risk at levels exceeding the basic dose limits and obtain their written consent to this.

Requirements on the protection of emergency workers and all other specialists involved in the response to a radiation emergency are provided by the National Safety Standards (NRB-2000), and other subordinated regulations.

Doses of workers undertaking an intervention could exceed the maximum single year dose limit for occupational exposure (50 mSv) only for the purpose of saving lives and/or preventing people from overexposure. In this case, workers should be male volunteers over 30 years old, who have consented to do the job in writing after being informed of possible doses and associated health risks (OSP-2002, para. 279,280,281). In a response, emergency workers should be informed about the possible risks and the APPENDIX 15 form should be completed. The current amendment on Recommended Emergency Workers Guidance Levels related to operation of nuclear power plants is given by the hygienic requirements for the design and operation of nuclear power plants (SP NPP-2010 Attachment 11).

During a visit on the premises of the Republican Special Response Team (RSRT) of the MES, the EPREV team was impressed with the specialized protective equipment and individual

protective means which they have to perform response functions in hazardous conditions. The RSRT first responders demonstrated their knowledge and skills in using protection devices and measuring radiation levels. It was clear that they had a good training and knew how to reduce risks in high radiation conditions.

The situation with other first responders is not clear, although representatives of the Police, Committee of Border Safety and State Custom Committee confirmed availability of protective means and individual dosimeters for their responders. The fire brigades, according to information from counterparts, are also provided with individual dosimeters if radiological accidents are suspected.

In Belarus there are excellent capabilities to assess and record the external doses received by emergency workers as well as by other personnel who are involved in undertaking response operations. The MH operates a national system of control of individual doses of the population. The State Dosimeter Register (SDR), which is operated by MH, collects information about doses of:

- Occupational
- Medical examinations
- Increased radiation (Chernobyl accident)
- Identified natural sources.

The database also integrates a subsystem covering the emergency worker doses received during the mitigation of the consequences of an accident or during the other phases of emergency response. Therefore, SDR provides optimal source of information about the dose records.

3.8.2 Good Practice

1. First responders from the Police (MI) and fire brigades (MES) are trained and are equipped with dosimeters; their effective doses are under control.

3.8.3 Findings

Interim (as well as longer term)

1. The EPREV team understood that the doses received by the first responder teams could be assessed and registered in the SDR. The appropriate formal procedures for record keeping and controlling the doses should be further strengthened.MH should further strenghen existing procedures and develop default operational levels of dosage for emergency workers for different types of response activities, which are set in quantities that can be directly monitored by the emergency workers during the performance of these activities. The operational levels should take into account all exposure pathways (such as external radiation, inhalation and ingestion).

2. Considering the advantages of the existing State Dosimeter Register (SDR), MH should develop and integrate in the SDR a database of doses of first responders.

3. Each organization which has designated emergency workers shall designate a person(s) with adequate qualifications, who is responsible for the radiation protection of emergency workers.

Long term

1. Appropriate steps must be taken on the sustainable improvement of the protection of local emergency workers (including police and fire brigades) and those who may respond to an emergency on site. This should include providing basic training in personal radiation protection, e.g. organization of a national training course/workshop, etc.

3.9. ASSESSING THE INITIAL PHASE

Appraisal criteria [2]:

- ***Establish default operational intervention levels (OILs) for radiological emergencies.***

3.9.1 Current situation

National operational intervention levels (OILs) for public protection in case of a radiation emergency were established by two Ministerial Resolutions issued jointly by MES and MH in August of 2006 and January 2009 (No 41/67 of 31/08/2006 and No 3/6 of14/01/2009 accordingly). The first document defines dose rate limits for making decisions on imposing restrictions on the immediate consumption of food, residency of the public in the contaminated territory, time limit of emergency workers in a high radiation zone, and other urgent protective actions (i.e. sheltering, temporary relocation, and evacuation). The second resolution put in force the instruction on conducting iodine prophylaxis in case of a radiation emergency at a nuclear facility. The OIL (dose rate) defined in this document for iodine prophylaxis is 50 μSv/h. The OILs for temporary relocation and resettlement are included in the new NREP (2007).

The OILs, together with the existing Generic Action Levels (GAL) for foodstuff (an amended version in approval process) give a reliable basis for decision making in a radiation emergency (see APPENDIX 7).

These OILs can also be used as reference values in the event of a nuclear accident abroad, when assessing any measured levels, either domestic or received through the international channels, to determine how far the domestic or foreign authorities are from the introduction of countermeasures (i.e. as a measure of severity of the situation).

3.9.2 Good practice

1. Implementation and strategy for use of OILs and action levels strongly contribute to an effective system to protect personnel and the public minimizing the negative consequences of emergency situations involving ionizing radiation.

3.9.3 Findings

Interim (as well as longer term)

1. In the emergency response plans, which consider radiation emergencies, or in appropriate procedures, introduce the concept of "inner cordoned area (safe distance) radius", which is explained in Appendix 5 of the EPR-METHOD [3]. These values are initial distances needed to prepare the area for managing radiation emergencies.

Long term

1. MH should adopt a methodology for revision of default OILs (IAEA TECDOC 955, GSG-2) [6, 7] in case of radiation emergencies.

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3.10 MANAGING MEDICAL RESPONSE

3.10.1 Current situation

Appraisal criteria [2]:

- ***Make arrangements for general practitioners and emergency staff to be made aware of the medical symptoms of radiation exposure and of the appropriate notification procedures if a nuclear or radiological emergency is suspected.***
- ***Make arrangements, at the national level, to provide initial treatment for people who have been exposed or contaminated.***

General practitioners and emergency staff seem to be aware of the medical symptoms of radiation exposure due to the experiences gained after the Chernobyl accident. Educational programs of the State Medical Universities and of the International State University named after Sacharov include the relevant topics. The medical part of the national Emergency Response Plan has been drawn up. A training program on radiation medicine has been established and studied at higher medical educational establishments.

The training program covers the following issues:

- Peculiarities of radiation injuries;
- Medical and biological effects of radiation and the basic principles of reduction of radiation exposure on the population;
- Radio-ecological situation in the Republic of Belarus;
- The behavior of radio nuclides in different ecosystems;
- Assessment of radiation dose;
- Health education, training, medical examination, rehabilitation, protection of the population exposed to radiation.

Training and retraining of health workers are performed at the Belarusian Medical Academy of Postgraduate Education, where two departments deal with:

- Department of radiological diagnostics – training and retraining courses in radiodiagnosis, medical radiation safety and a course on "Radiation accidents at nuclear power plants". 186 medical staff members passed the retraining course on higher education in the discipline of radiation medicine in 2009;
- Department of Emergency Care and Disaster Medicine - as part of retraining in the course "Ambulance", a course on protective measures during emergency conditions, combined with radioactive contamination.

Currently, additional efforts are being taken to strengthen education and training of staff in nuclear power related topics in the framework of the special State Program on training staff in the nuclear area for 2008-2020 (Approved by Governmental resolution No 1329 of 10.09.2008).

The Republican Medical Radiology Team (RMRT) was created on the basis of the state institution Republican Scientific Practical Center of Radiation Medicine and Human Ecology (Gomel). Territorial radiological teams are created on the basis of regional hospitals.

The Republican Scientific Centre of Radiation Medicine and Human Ecology (GOMEL) has been designated to accept casualties with injuries combined with radiological consequences. It has a detailed response plan and procedures, including arrangements for request for international assistance. Within the framework of the SSPEES, the Ministry of Health has developed a National Service for sanitary treatment of victims of mass casualty and has created special medical teams with a stock of materials and supplies for providing medical care in case of mass casualty events (disasters). There are one national and 6 regional Centers of Emergency Medicine designated to treat people who have been exposed or contaminated.

According to the functions of the MES, medical services fall within the eighteen recognized priorities. In the NREP, Chapter 4.7 describes the principles for medical response, where cooperation is foreseen between MES and MH, MA, MT, MD and others. According to the state level response, the radiological teams of specialized medical care are included in the structures of the subsystem of disaster management of MH and designed to provide specialized medical aid to people affected by a disaster connected with a radiation emergency.

The stable iodine issue has been addressed by the Joint Resolution of the Ministry of Emergency Situations of the Republic of Belarus and the Ministry of Health of the Republic of Belarus, by the approval of the Instruction on conducting iodine prophylaxis in case of a threat or occurrence of a radiation emergency at nuclear facilities (2009, No 3/6). In order to promptly provide iodine prophylaxis for the population, health organizations established the provision of a daily supply of medicines containing stable iodine, which are to be issued to the population-based deployable outlets distributing teams. For the continuation of iodine prophylaxis (2 and subsequent days) medicines that contain stable iodine are taken from the mobilization reserves. For iodine prophylaxis under the control of MH, there are approximately 2709 kg KI and 4243 liter of 5% dilution of stable iodine.

3.10.2 Good practice

1. A national educational system includes arrangements for general practitioners and medical emergency staff to be made aware of the medical symptoms of radiation exposure, and this has been established in accordance with international practices.

3.10.3 Findings

Interim

1. For the first responders who are responsible for first aid, and for other medical staff who may encounter potentially contaminated patients, it is necessary to include instructions in their training program regarding treatment of potentially contaminated patients. These instructions should describe procedures for decontamination of patients, and should raise awareness that

customary medical protective clothing (gowns, face masks, latex gloves, shoe covers) provides excellent protection against contamination.

2. Additional arrangements should be made on establishing an appropriate notification procedure and other immediate actions warranted by medical emergency response units if a radiation emergency is suspected.

3. The Ministry of Health should take steps to ensure that, in case of severe radiation injuries, which should be treated by specialists, a request for assistance will be promptly channeled to the IAEA.

4. The Ministry of Health would benefit from conducting national training courses on Medical Response to Radiological emergencies, based on the standard IAEA training materials. This training may be supported by the IAEA on request from Belarus through the official channels.

Long term

1. Develop an outreach campaign to ensure general practitioners are well aware of the medical symptoms of radiation exposure. The IAEA leaflet on recognition of radiation injuries and also [5] may be used for this purpose.

3.11. KEEPING THE PUBLIC INFORMED

Appraisal criteria [2]:

- ***Make arrangements for providing useful, timely, truthful and consistent information to the public, responding to incorrect information and rumors, responding to requests for information from the public and from news and information media.***

3.11.1 Current situation

Within the key roles of the SSPEES, the MES in cooperation with other Ministries and Agencies (see 3.7), has recognized the need to provide information to the mass media and, following the national plan, local executive bodies should provide information to the public about the radiation situation.

During an emergency and in the post-emergency period, information for the public is disseminated by the mass media and through a press centre that is established under the headquarters for emergencies for communication with the public. Depending on their levels, public relations issues are to be set in on-site emergency plans and emergency response plans of relevant territorial and functional subsystems of the SSPEES. The role and duties are determined by the NREP (2007).

In case of a radiation emergency, the Public Information Centre (PIC) is established close to the site of the emergency and in Minsk. Press secretariats (PIC) in Minsk and in the region have assigned function to be performed by a trained staff of the press secretary. Press releases should be coordinated between participating organizations, ministries and local authorities. The spokesperson is a designated position within the emergency response organization.

With respect to experiences with the Chernobyl accident the population in Belarus is sensitive on radiation issues and there was extensive education of the public. During the meeting with the representatives from MES a leaflet was presented to increase the readiness of the population to chemical and radiation accidents including topics on:

- Locations at risk from radiation (including information on "dirty bomb")
- Consequences (of uncontrolled radiation)
- Forms of protection

Communication with the public and media is usually part of higher level exercises. The last exercise involving this element was performed in September 2010 during the common exercise with Smolensk NPP.

The Law 141-Z (Art 8) requires provision of transparent and truthful information to the public in case of an emergency situation. Information about possible risks, as well as information about nuclear, radiological, chemical, biomedical, explosion, fire and environmental safety of the public in their respective territories should be provided. The provision of information regarding emergency situations, as well as the activities of the state administration bodies for emergency situations, other national government bodies, state organizations, local executive and administrative bodies and other organizations should be transparent and open. Central governmental authorities, local executive and administrative bodies and other organizations must quickly and accurately inform the public through the media and other channels on emergency situations and on any necessary protective measures.

3.11.2 Findings

Interim (as well as longer term)

1. Testing the capacity for informing the public must be an integral part of regular exercises. The exercise scenario should include involvement of the media and the media should be motivated to participate in exercises. Alternatively media communication should be simulated using the organization's own teams or inviting external participants (e.g. journalism students).

2. The staff responsible for preparation and approval of press releases should be designated in advance. In addition, the information pathways should be described in the Emergency Response Plans or in procedures, outlining to which media information should be sent, by which means (facsimile, e-mail, telephone), and identifying the responsible person to authorize the submission/distribution of this information.

3.12. TAKING AGRICULTURAL COUNTERMEASURES AGAINST INGESTION AND LONGER TERM PROTECTIVE ACTIONS

Appraisal criteria [2]:

- ***Adopt national intervention and action levels for agricultural countermeasures.***
- ***Make arrangements, concentrating on the use of existing capabilities, for taking effective agricultural countermeasures.***

3.12.1 Current situation

Generic action levels for foodstuffs are established in line with the international requirements [2] and are given in Appendix 7. The NRB-2000, APPENDIX 7, 8, defines activity concentrations (generic action levels) above which foodstuffs must be restricted for general consumption for a period of one year after an emergency. These levels are in compliance with international recommendations.

OILs (3.9) for dose rates due to deposition and deposition densities were developed with regard to the situation after the Chernobyl accident and should be reviewed. The NREP (2007) includes taking agricultural countermeasures and defines duties, responsibilities and rights of the ministries and authorities to be involved in taking the appropriate actions. The arrangements are based on the Chernobyl experience and include restriction of the consumption, distribution and sale of locally produced foods, timely monitoring for ground contamination, sampling and analysis of food and water, etc. There are special recommendations and instructions, which need to be reviewed and updated to be totally consistent with the international requirements.

Work to control the content of radionuclides in food products is carried out in two directions:

a) State Sanitary Inspection controls compliance with existing hygienic standards, sanitary norms and rules, including the organization and conduct of the departmental radiation monitoring activities engaged in harvesting, production, processing and marketing of products;

b) Radiation control of foodstuffs produced in private farms is conducted in accordance with the State program on overcoming effects of the accident at the Chernobyl NPP for 2006 – 2010.

Main roles in monitoring of foodstuff, water and the environment are assigned to:
a) Ministry of Natural Resources and Environmental Protection
b) Ministry of Health
(See description in Chapter 3.1.1)

The interaction between the MES, MH and MNREP covers information exchange and cooperation in emergency preparedness and response activities.

In case of accidents in which radioactivity is emitted, the Network of Supervision and Laboratory Control (NSLC) can be deployed. The NSLC unites most of the monitoring and radiology units (laboratories) with capabilities for environmental and food measurements, i.e. those available at the Ministry of Natural Resources and Environmental Protection, Ministry of Health, State Forest Protection Committee, Ministry of Agriculture and Food, Service of Plant Protection, Veterinary Service, etc. These are 142 centers of Hygiene, Epidemiology and Public Health, 124 veterinary posts of supervision and 177 analytical laboratories. Exercises to test the NSLC operations are annually conducted.

A scheme of organizations and resources included in the NSLC is given in APPENDIX 6.

3.12.2 Good Practice

1. There is a fully functional operating system for conducting radiation environmental monitoring and control of contamination of food. The creation of NSLC is a very positive experience on how to ensure effective coordination and timely radiation monitoring in case of a radiation emergency.

3.12.3 Findings

Interim (as well as longer term)

1. Sampling procedures for food, crops, and agricultural soil in the event of an emergency should be integrated into the National Nuclear Emergency Response Plan. (i.e., where to take soil samples, which crops and where should be sampled, frequency and size of samples, etc.).

Long term

1. In spite of the Chernobyl experiences, agricultural countermeasures and long term protective actions should be addressed and exercised in the framework of national level exercises.
(**Note:** National level exercises are typically oriented on the early phase of an accident (notification, information, mitigation of consequences, and implementation of urgent protective actions) when leaves a gap regarding the verification of arrangements for long term protective measures.)

3.13. MITIGATING THE NON-RADIOLOGICAL CONSEQUENCES OF THE EMERGENCY AND THE RESPONSE

Appraisal criteria [2]:

- ***Make arrangements for responding to public concern in an actual or potential nuclear or radiological emergency.***

3.13.1 Current situation

The mitigation of non-radiological events is a part of emergency management measures in case of a radiation emergency. Providing true and timely information to the public, effective coordination of protective measures, intervention of necessary state and local authorities, insurance of the necessary, possibility of direct access to public information centers should all contribute to the mitigation of the direct consequences of the radiation emergency and the response.

In the case of Belarus governmental efforts supported by international assistance to manage the large consequences after the Chernobyl accident in the country had contributed to a better understanding and it should facilitate a more common approach of the intervening emergency organization and the public.

The NREP (2007) establishes arrangements to respond to public concerns in an actual or potential radiation emergency and to assign duties to relevant territorial and functional

subsystems of the SSPEES. At the established PIC, the press secretary of the responding organization is qualified to communicate and to answer questions.

The public's rights to have true information on a radiation situation (all conditions) are included in terms of the act on the Use of Atomic Energy (Chapter 10, para 39 (2, 3). Individuals, public associations and other organizations have the right to obtain information on radiation conditions. Individuals who have been exposed to ionizing radiation have the right to obtain information on the received doses.

3.13.2 Findings

Interim

1. Using the advantage of new information technologies (INTERNET), the relevant state organizations should consider extending the use of their web sites to educate the public and facilitate communication with the public using electronic communication through publicly announced addresses regarding safety and protection issues. These arrangements should also be used during an emergency situation.

2. A scenario for testing capabilities to mitigate the non-radiological consequences of an emergency response should be elaborated and, according to simulated conditions, exercised, to check the existing gaps.

Long term

1. For the mitigation of non-radiological consequences of an emergency response, the following issues are considered to be the required long-term activities:

- The team responsible for public information should follow media coverage and public response. The public information team should develop working practices to ensure that the messages (press releases) sent out after the initial notification contain information to correct false or misinterpreted reports, if such reports appear in the media.
- Develop necessary procedures which can be used during activities related to the mitigation of the non-radiological consequences in line with the approach (strategy) developed in the previous recommendation, (i.e., insurance in the event of economic losses or advice by a team of psychologists to handle fears and worries, specific information to target audiences about trade, transport and different events, such as cultural, sports, religious, political, etc.).

2. Carry out a long-term public educational program to improve the level of knowledge in radiation protection, and awareness of basic information about radiation emergencies among the general public. For this purpose leaflets and brochures developed by the IAEA (some available in Russian) can be used. This should be a joint effort by MES, the Ministry of Health and the Authorities responsible for education and public information.

3.14. REQUIREMENTS FOR INFRASTRUCTURE

Appraisal criteria [2]:

- ***Develop emergency plans that are consistent with the threats and coordinated with all response organizations.***
- ***Operating and response organizations should develop the procedures needed to perform their response functions.***
- ***Provide, concentrating on the use of existing capabilities, adequate tools, instruments, supplies, equipment, communication systems, facilities and documentation.***
- ***Identify facilities at which the following will be performed: (a) coordination of on-site response actions; (b) coordination of local off-site response actions (radiological and conventional); (c) coordination of national response actions; (d) coordination of public information; (e) coordination of off-site monitoring and assessment.***
- ***Make arrangements, concentrating on the use of existing capabilities, for the selection of personnel and training.***
- ***Conduct exercises and drills to ensure that all specified functions required to be performed for emergency response and all organizational interfaces for the facilities in threat categories I, II and III and the national level programs for the threat category IV and V are tested at suitable intervals.***
- ***Make arrangements to ensure the availability and reliability of all supplies, equipment, communication systems and facilities needed during an emergency.***

3.14.1 Current situation

The legislation clearly requires that an operator develop an emergency plan for protecting personnel and the public in the event of a radiation accident, as a prerequisite for getting an authorization (license) for any facility or practice/source whose operation can give rise to a radiation accident or emergency. The regulatory documents (Section IV of OSP-2002, para. 17-19 of the Law of the Republic Belarus On Radiation Safety of Public) require that design documentation (for licensing process) of a facility must contain an Emergency Response Plan including a list of potential radiological emergencies with the forecast of consequences, as well as the section "Engineering and technical measures on warning emergency situation" necessary for ensuring the elimination of consequences of a radiation emergency.

The operating organization must develop a Radiological Emergency Plan in coordination with the MES, MH and local administrative authorities and should obtain their approval. Moreover, each facility should have Regulations (Guidance) on Personnel Responsibilities in Emergency Situations.

According to the requirements, the operating organization must:

- Develop personnel training programs for effective and quick response to emergencies and ensure they are periodically carried out (no less than once every two years) taking into account the current activities at the facility;
- Ensure preparedness of personnel for Design Basis Accidents (DBA) and Beyond Design Basis Accidents (BDBA).

The Act on the Use of Atomic Energy (Chapter 7) extends the requirements on emergency preparedness and response and addresses both the on-site and off-site plans. There is a clear requirement on the establishment of planning zones (see APPENDIX 7), and the necessity to have and maintain the level of material/technical support and staff included in the off- and on-site emergency plan.

The plans for emergency response in case of radioactive contamination of the territory of Belarus as a result of nuclear emergency (addressed mainly Ignalina NPP, Smolensk NPP, Chernobyl NPP, Rovno NPP), or radiological emergency at the facility for spent fuel and radioactive waste in the neighboring countries (Lithuania, Ukraine, Russia) have been elaborated as a part of the State program for prevention and elimination of emergency situations of natural and man-made character. The body for control of the Emergency Preparedness and Response (EPR) system is the MES, which co-ordinates and takes measures on provision of preparedness to specified kinds of emergencies. It includes training, exchange of information and organization of the cooperation with the neighboring states that have nuclear power plants and facilities for managing spent fuel or waste.

The Law 426-Z on Use of Atomic Energy, which establishes conditions for the construction and operation of nuclear power plants, gives a comprehensive legal framework governing the siting, planning, construction, commissioning, operation, life extension and decommissioning of nuclear installations and storage facilities. In this framework, requirements relating to the physical protection, emergency preparedness and response, liability for nuclear damage, responsibilities of operators, rights of workers and the management of nuclear materials, spent nuclear fuel and/or operational radioactive waste are also included.

The referred law assigns responsibilities to the Ministry of Energy, the Ministry for Emergency Situations, Republic-level state control agencies and other state organizations.

According to the information obtained and visit to licensed users (SOSNY), operating organizations have emergency plans and procedures for on site response actions and to respond to different emergency situations. Existing procedures are periodically reviewed and updated. The set of procedures was inspected during the visit to SOSNY (see e.g. APPENDIX 10).

At the operator level the task to develop and implement the facility Emergency Response Plan is defined in OSP-2002 and it is required by the licensing procedure. The NREP (2007) has been developed also taking into account the risk of radiological contamination resulting from accidental releases at the NPPs of neighboring countries.

The operating organization must familiarize workers with the emergency plans and carry out special training of workers who will have duties under these plans (Act on the Use of Atomic Energy, Art 29 (1)). Procedures should be developed and included in the relevant emergency response plans.

The coordination of the response at different levels is performed as follows:

- Coordination of on-site response actions is the responsibility of the Commission for Emergency Situations (CES) of the appropriate enterprise or organization;
- Coordination of local off-site response actions (radiological and conventional) is the responsibility of the CES under the regional and local executive bodies;

- Coordination of national response actions is the responsibility of the CES under the Council of Ministers;
- MES has the responsibility of coordination of public information;
- Coordination of off-site monitoring and assessment is performed by the Republican Centre of Radiological Control and Monitoring (RCRMC) of the Ministry of Natural Resources and Environmental Protection.

Following the National Plan (to all hazards), response to radiation emergencies should be implemented according to the NREP, which defines organizations, facilities and logistical support provided for emergency response actions by the SSPEES.

A multi-level educational and training system is in place. This ensures that personnel assigned to positions with responsibilities for emergency response are adequately trained. The educational basis includes the Institute for Retraining and Professional Development (IRPD) of the MES, Command-Engineering Institute (CEI) (Minsk located) and Gomel Engineering Institute (GEI) located in Gomel.

The IRPD was established in 1996. It is located in Borisov district (Svetlaya Roshcha), Minsk region, 90 km from Minsk. The Institute utilizes a territory of 150 sq. km. It includes numerous structures that were built specifically for basic training and continuing education purposes of Belarusian rescue workers. The structures are designed for practical training of field officers in emergency subdivisions with special emphasis on fire control measures. More than 2000 rescuers receive additional qualification or retraining from the MES, as well as around 500 students from other government institutions. The length of the training courses varies from 1 week to 3 months.

The IRPD is an internationally recognized center for practical training of field officers and specialists in the area of fire control and management of emergency situations conforming to international standards.

Taking into account the new nuclear program, the Government of Belarus addresses issues of strengthening manpower resources in the area of radiation protection. In 2008, the Council of Ministers of the Republic of Belarus approved the State Program of Human Resources Development for the Nuclear Energy Sector for 2008-2020. The Program is aimed at establishing a comprehensive system of human resources development, which will ensure knowledge and skills required for construction and safe operation of the NPP, nuclear and radiation safety, safety of NPP personnel, the public and the environment. In accordance with the Program, new specializations were opened in the following higher educational institutions:

- Belarusian State University;
- Belarusian State Technical University;
- Belarusian State University of Information Technologies and Radio Electronics;
- Sakharov's International Ecological University.

Belarus receives significant assistance from the IAEA in the area of human resources development. Presently, Belarus implements the national IAEA Technical Cooperation project BYE/006 Development of Human Resources and Training System for the Nuclear Power Program.

Emergency exercises are conducted at all levels of the SSPEES on a regular basis according to the approved schedule. The local and facility level drills and exercises are conducted annually. There is an annual exercise for testing the Network of Supervision and Laboratory Control (NSLC), as it has been mentioned in 3.12.1. National and regional capabilities and organizational interfaces in case of a response to a potential or actual emergency at the NPP of a neighboring country must be tested at intervals defined by the new NREP (2007). Regional exercises titled "Organization of public and territorial protection in the event of potential or actual emergency at the Ignalina NPP" were conducted in 2002 in four regions: (Mogilev, Grodno, Minsk and Brest). In September 2010 the regional exercise "Organization of public and territorial protection in the event of potential or actual emergency at the Smolensk NPP" was performed jointly with MES of the Russian Federation.

Arrangements (a Quality Assurance Program) to ensure the availability and reliability of all systems and facilities are under development. As required, the emergency response plans and procedures as well as training programs for their testing shall be reviewed on a regular basis and lessons and experience learned during the exercises shall be discussed and registered in order to make necessary modification or improvements.

3.14.2 Good practice

1. MES and MH regularly conduct retraining, drills and exercises for personnel involved in the SSPEES using accident scenarios with radioactive sources.

2. IRPD has very good capabilities (library, tools, development of training materials, accommodations, etc.) for providing training to emergency staff, including training of first responders and rescue teams in responding to various types of radiological emergencies.

3.14.3 Findings

Interim

1. In each emergency response organization a screening should be made to see if the scope of all procedures matches the responsibilities of that particular organization to determine if some procedures are still missing. The list of procedures should be included in the respective organization's emergency response plan.

2.The evaluation of exercises shall be transposed into an action plan, so that lessons learned are fed back into the system (in updating plans, procedures, training, acquiring new equipment) and also lessons learned on one level are conveyed to another, if applicable (i.e. county level should convey lessons learned to national level)..

3. Existing libraries and the knowledge network at CEI and IRDP should be recruited with the IAEA EPR series publications and international norms and standards in radiation protection. The arrangements for receiving IAEA publications may be initiated in the framework of the national IAEA Technical Cooperation project BYE/006 "Development of Human Resources and Training System for the Nuclear Power Program".

4. Professional training of emergency professionals at the CEI should be extended and include practical exercises using modern technologies of radiation measurements in the field and in emergency conditions.

Long term

1. Local and international experience in responding to emergency situations involving uncontrolled radiation sources should be used to optimize the response procedures and update the training program. Drills should be organized with the participation of medical response units, e.g. for the treatment of contaminated patients. The IAEA could provide expert assistance in organizing and conducting such drills or exercises.

2. The maintenance of competence in all first response teams is a long term task, requiring a well-designed training program, human resource management and exercising. The on-site and off-site local first response units, as well as local officials and other bodies responsible for responding to the emergencies within the SSPEES, should be trained on radiation protection on a regular basis. The scenario for drills and exercises should include a component on radiological emergencies. This allows for qualified personnel at local levels, who can be mobilized in case of any emergency involving the hazard of ionizing radiation.

3. A set of criteria should be developed to assist in emergency exercises and drills evaluation. These criteria will be used as objective indicators to determine how well the exercise met its objectives.

4. A long-term (e.g. five year) radiation emergency exercise program should be adopted to ensure that the planned frequency is respected in terms of participation, objectives and coordination with other types of exercise.

APPENDIX 1: Documents provided by the counterpart

(Documents delivered in printed or in electronic form in Russian Language)

1. Law of the Republic of Belarus "On Use of Atomic Energy", 2008, No 426-З
2. Law of the Republic of Belarus "On Radiation Safety of the Public", 1998, No 122-З
3. Law of the Republic of Belarus "On Protection of the Public and the Territories in Emergency Situations of Natural and Man-made Character, 1998, No 141-З
4. Resolution of the Council of Ministers of the Republic of Belarus "On State System for the Prevention and Elimination of Emergency Situations", 2002, No 495
5. Decree of the President of the Republic of Belarus "On Licensing of Certain Individual Types of Activities", 2003, No 17
6. Law of the Republic of Belarus "On Legal Regimen on Territory Impacted by Radioactive Pollution Caused by the Accident at the Nuclear Power Plant Chernobyl", 1991, No. 1227-XII
7. Resolution of the Council of Ministers of the Republic of Belarus "On the Unified State System of Control and Records of Individual Radiation Doses", 1999, No. 929
8. Resolution of the Council of Ministers of the Republic of Belarus "On Confirmation of the Status of Activities Licensing in the Area of Industrial Safety and the Status of Licensing Concerning Assurance of Fire Safety", 2003, No 1357
9. Resolution of the Council of Ministers of the Republic of Belarus "On Establishing the Commission for Emergency Situations under the Council of Ministers of the Republic of Belarus and its Working Body together with its Constitution", 2002, No 377
10. Resolution of the Ministry of Health of the Republic of Belarus "On Approval of Sanitary Standards, Regulations and Hygienic Norms" Hygienic Requirements for Design and Operation of Nuclear Power Plants (SP NPP-2010), 2010, No 39
11. A list of the International Agreements of the Republic of Belarus
12. Decree of the President of the Republic of Belarus "On Licensing of Individual Types of Activities", 2010, No 450
13. Decree of the President of the Republic of Belarus "On the Results Achieved in Regulatory Activities in Belarus", 2009, No 450
14. Resolution of the Council of Ministers of the Republic of Belarus "On Approval of Regulations on the Interaction between National Government Bodies, other State Agencies and Organizations in Detecting Sources of Ionizing Radiation, as well as in the Case of their Confiscation when Moving across the State Border of the Republic of Belarus", 2009, No 560
15. Emergency Reponses Questionnaire (E. V. Korolyieva)
16. Resolution of the Council of Ministers of the Republic of Belarus "On Adjustment of the Instructions concerning Determination of Structures Representing Increased Natural and Ecological Threat Directly Recorded in Diversified Status", 2003, No 29

17. Joint Resolution of the Ministry of Emergency Situations of the Republic of Belarus and the Ministry of Health of the Republic of Belarus "On approval of the Instruction on Conducting Iodine Prophylaxis in case of Threat or Occurrence of a Radiation Emergency at Nuclear Facilities" , 2009, No 3/6
18. Resolution of the Council of Ministers of the Republic of Belarus "On approval of the Procedure for Development of Emergency Plans", 2010, No 1242
19. Joint Resolution of the Ministry of Emergency Situations of the Republic of Belarus and the Ministry of Health of the Republic of Belarus "On Approval of Dose Rate Limits for Purpose of Making Decisions about Taking Urgent Protective Actions, 2006, No 41/67
20. Resolution of the Ministry of Health of the Republic of Belarus "On Basic Radiation Safety Standards" (NRB-2000), 2000, No 5
21. Resolution of the Ministry of Health of the Republic of Belarus "On Basic Sanitary Rules for Radiation Safety" (OSP-2002), 2002, No 6
22. Guide (Emergency Plan) for Activities of Personnel in Case of Emergency Situations at Sub-critical Facility "Yalina", 2007, No. 07-246-08
23. Guide for Activities of Personnel in Case of Emergency Situations during the Work with Sources of Ionizing Radiation at Isotopic Research Centre 04 "Revitalization of Natural Contaminated Areas"
24. Guide for Activities of Personnel in Case of Emergency Situations at a Critical Facility, 2007, No. OT-362-07
25. Guide for activities of personnel in case of emergency situations during the work with sources of ionizing radiation and chemical research of environment (isotopic laboratory 05), Minsk, 2010
26. Guide for activities of Personnel in Case of Emergency Situations during the Work in Laboratory 06 "Radionuclide Forms (Metal-ion) in Solutions" OT-06
27. Guide for Activities of Personnel in Case of Emergency Situations during the Work with "III Laboratory of Experimental Nuclear and Technical Research and Experimental Analyses of Radioactive Materials", No. 13 "Guide for activities of personnel working in the storage of non-irradiated nuclear materials "JAVAR" in emergency situations"
28. Guide for Activities of Personnel in Case of Emergency Situations during the Work at the Electron Accelerator UELB-10-10 OT-345-07
29. Guide for activities of personnel in case of emergency situations during the work at the complex of storage systems and treatment of spent nuclear fuel
30. Guide for activities of personnel in case of emergency situations during the work with gamma source UGU-OPT and T-09
31. Guide for radiation safety at GNU "OIEAI-Sosny" Academy of Sciences of Belarus, RB-080-OPB-09
32. Plan on protection of workers and public from radiation accidents and consequences, RB-036 "OIEAI-SOSNY"-07, 2007
33. The Fifth National Report of the republic of Belarus under the Convention on Nuclear Safety, Minsk, 2010

34. Chapter “Emergency Plan for Radiation Emergencies” from the Plan for the Protection of the Public and country from emergency situation of natural and manmade origin” (29 pages)
35. Statistics on graduated persons in IRPD 2003-2010 in the area of radiation emergencies
36. Statistics on graduated persons in IRPD 2003-2010 in area of chemical emergencies
37. Syllabus of Instruction on “Response to the chemical, biological, nuclear and radiological substances-caused incidents”, IRDP, 2009
38. Syllabus for “Response to radiation accidents and incidents”, IRDP, 2009Study material “Response to radiation accidents and incidents”, IRDP, 2009 (110 pages)
39. Syllabus for “First medical aid at radiation injuries”, IRDP, 2009

APPENDIX 2: International agreements in the area of peaceful use of nuclear energy

Title	In Force	Status
Agreement on the Privileges and Immunities of the IAEA	1966-12-02	Acceptance: 1966-12-02
Vienna Convention on Civil Liability for Nuclear Damage	1998-05-09	Signature: 1997-05-27 Ratification: 1998-02-09
Convention on the Physical Protection of Nuclear Material	1993-06-14	Succession: 1993-09-09
Convention on Early Notification of a Nuclear Accident	1987-02-26	Signature: 1986-09-26 Ratification: 1987-01-26
Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	1987-02-26	Signature: 1986-09-26 Ratification: 1987-01-26
Convention on Nuclear Safety	1999-01-27	accession: 1998-10-29
Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	2003-02-24	Signature: 1999-10-13 ratification: 2002-11-26
Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage	2003-10-04	Signature: 1998-09-14 Ratification: 2003-07-04
Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)	1990-06-29	Signature: 1990-06-29
Agreement between the Republic of Belarus and the IAEA for the Application of Safeguards in connection with the NPT	1995-08-02	Signature: 1995-04-14
Additional Protocol to the Agreement between the Republic of Belarus and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons		Signature: 2005-11-15

Bilateral agreements in the area of peaceful use of nuclear energy

1. Agreement between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation and mutual assistance in prevention of large-scale man-made catastrophes and natural disasters and elimination of their consequences of 18.12.1993;

2. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Poland on prompt notification about nuclear accidents and cooperation in the area of radiation safety of 26.10.1994;
3. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Austria on exchange of information in the area of nuclear safety and protection against ionizing radiation of 09.06.2000;
4. Agreement between the Government of the Republic of Belarus and the Cabinet of Ministers of the Ukraine on cooperation in prevention of emergencies and elimination of their consequences of 07.07.2000;
5. Agreement between the Government of the Republic of Belarus and the Government of Kyrgyz Republic on cooperation in the area of civil defense, prevention and mitigation of emergencies of 30.05.2001;
6. Agreement between the Government of the Republic of Belarus and the Cabinet of Ministers of the Ukraine on prompt notification of a nuclear accident and cooperation in the area of radiation safety of 16.10.2001;
7. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Latvia on cooperation in the area of prevention of catastrophes, natural disasters and other emergencies and liquidation of their consequences of 08.07.2003;
8. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Latvia on cooperation in the area of prevention of catastrophes, natural disasters and large-scale accidents and elimination of their consequences of 16.12.2003;
9. Agreement between the Government of the Republic of Belarus and the Federal Council of the Swiss Confederation on cooperation in the case of a natural disaster, crisis or large-scale accident of 12.09.2004;
10. Agreement between CIS Member States on the main principles of cooperation in the peaceful use of nuclear energy of 26.06.1992;
11. Agreement between CIS Member States on cooperation in the area of prevention and liquidation of consequences of man-made and natural disasters of 22.01.1993;
12. Agreement between CIS Member States on control over trans-boundary movement of dangerous sources and other waste of 12.04.1996;
13. Agreement between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the area of peaceful use of atomic energy (approved by the Ordinance of the Council of Ministers of the Republic of Belarus of 29 August 2009, № 1125).
14. Agreement between the Government of the Republic of Belarus and the Government of the People's Republic of China on cooperation in the area of the peaceful use of atomic energy (approved by the Ordinance of the Council of Ministers of the Republic of Belarus of 23 April 2009, № 518).

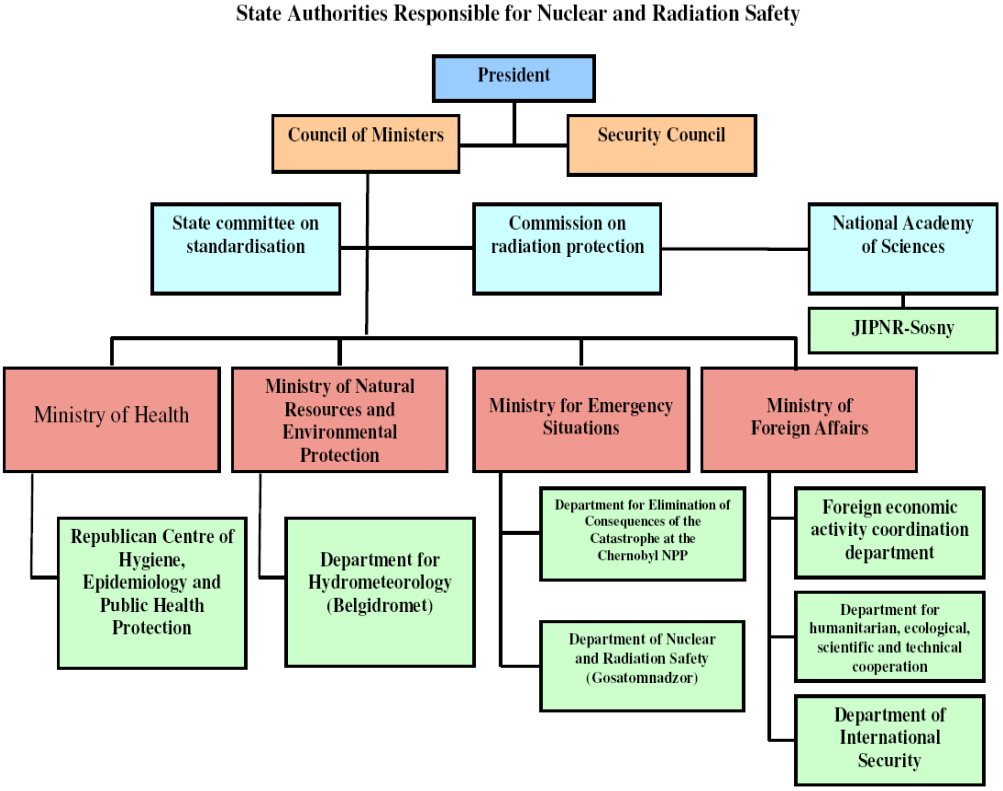
APPENDIX 3: **Persons met during the mission**

NAME	POSITION	ORGANISATION
Alexander Dokuchaev,	**Head, Department of International Cooperation**	**MES**
Sergey Pribylev	**Head, Laboratory of Chemical and Radiation Safety**	**RSRT, MES**
Aliaksandr Makouchyk	**Head of the Institute**	**IRPD, MES**
Aliaksei Varabyou	**Head of the Center**	**RCEMR, MES**
Viatcheslav Kuvshinov	**Director General**	**SOSNY**
Evgeniy Baranovskiy	**International Cooperation Department**	**MES**
Svetlana Moshchinskaya	**International Cooperation Department**	**MES**
Leonid Dedul	**First Deputy Head, Organizational support, Commission of Emergency Situations**	**MES**
Alexander Kudriyashov	**Head of the Institute**	**SRIFSE**
Oleg Panchuk	**Head of Department**	**MH**
Elena Nikolaenko	**Expert**	**MH**
Boris Kazakov	**Head, Section for radiation, chemical and biological protection**	**NBC**
Viktor Lishankov	**Head of Division**	**SCC**
Vasili Paliukhovich	**Head of the Department**	**GOSATOMNADZOR, MES**
Grigori Astashka	**Deputy Head of the Department**	**GOSATOMNADZOR, MES**
Boris Kazakov	**Head, Department of Chemical, Biological and Radiological Protection**	**CBS**
Alexander Trusov	**Unit for radiation chemical, and biological protection of Army General Staff**	**MD**

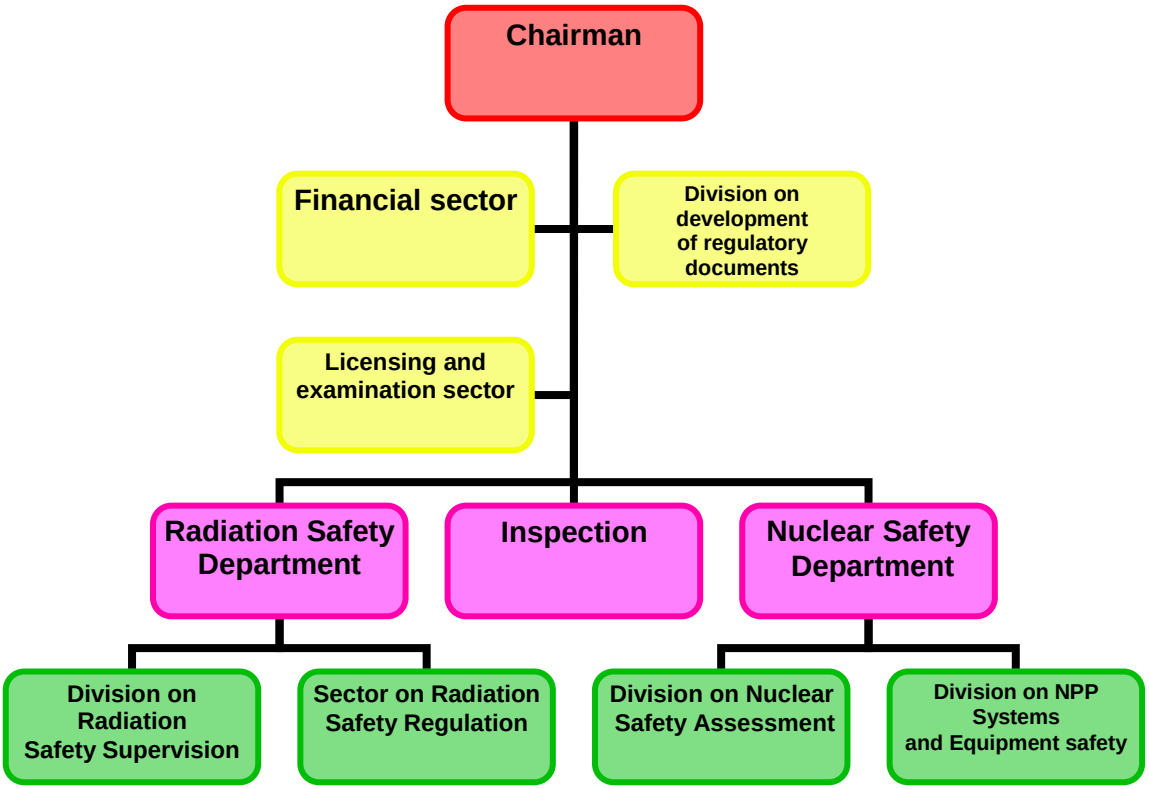
Note: During the meetings and visits other staff members of ministries, institutions and visited organizations were also met, but there was no clear identification of names and positions.

APPENDIX 4: Structures and networks

Regulatory infrastructure of radiation safety in the Republic of Belarus



APPENDIX 5: Organizational structure of the GOSATOMNADZOR

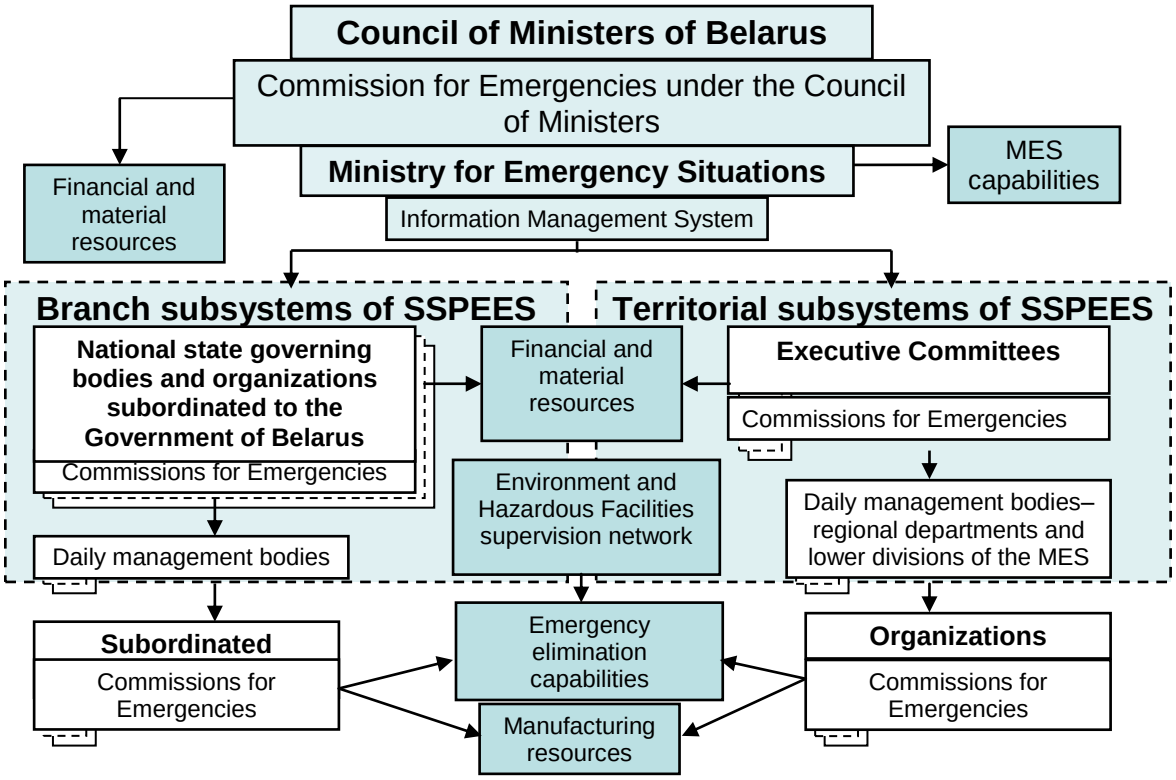


The Ministry for Emergency Situations is defined as a state regulatory body in the field of nuclear and radiation safety. The department on Nuclear and Radiation Safety of the Ministry for
Emergency Situations of the Republic of Belarus (GOSATOMNADZOR) is a department of the Ministry with the rights of a legal entity.
GOSATOMNADZOR has the following basic tasks in the field of radiation safety:

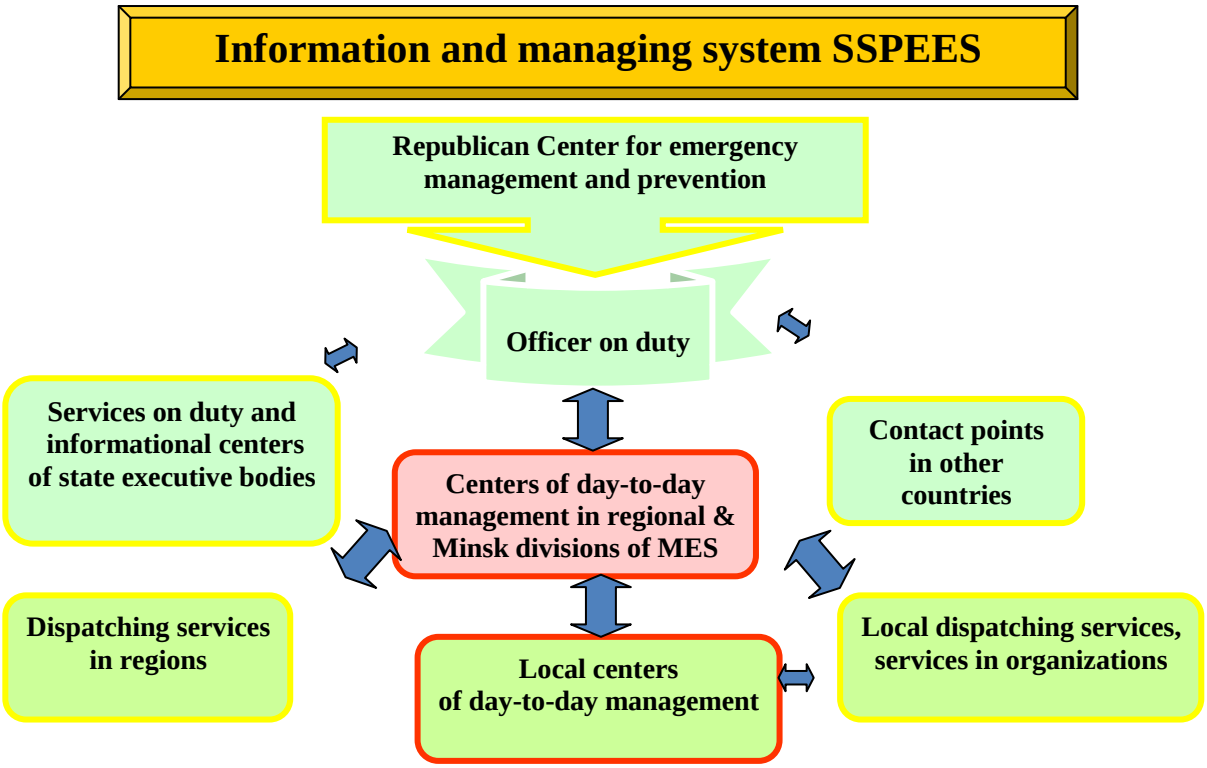
- Exercising of state regulation and supervision in the field of radiation safety;
- Ensuring the control over the execution of legislation in the field of radiation safety.

APPENDIX 6: Organizational charts of the SSPEES, MES and monitoring networks

Organizational chart of the State System for Prevention and Elimination of Emergency Situations (SSPEES)

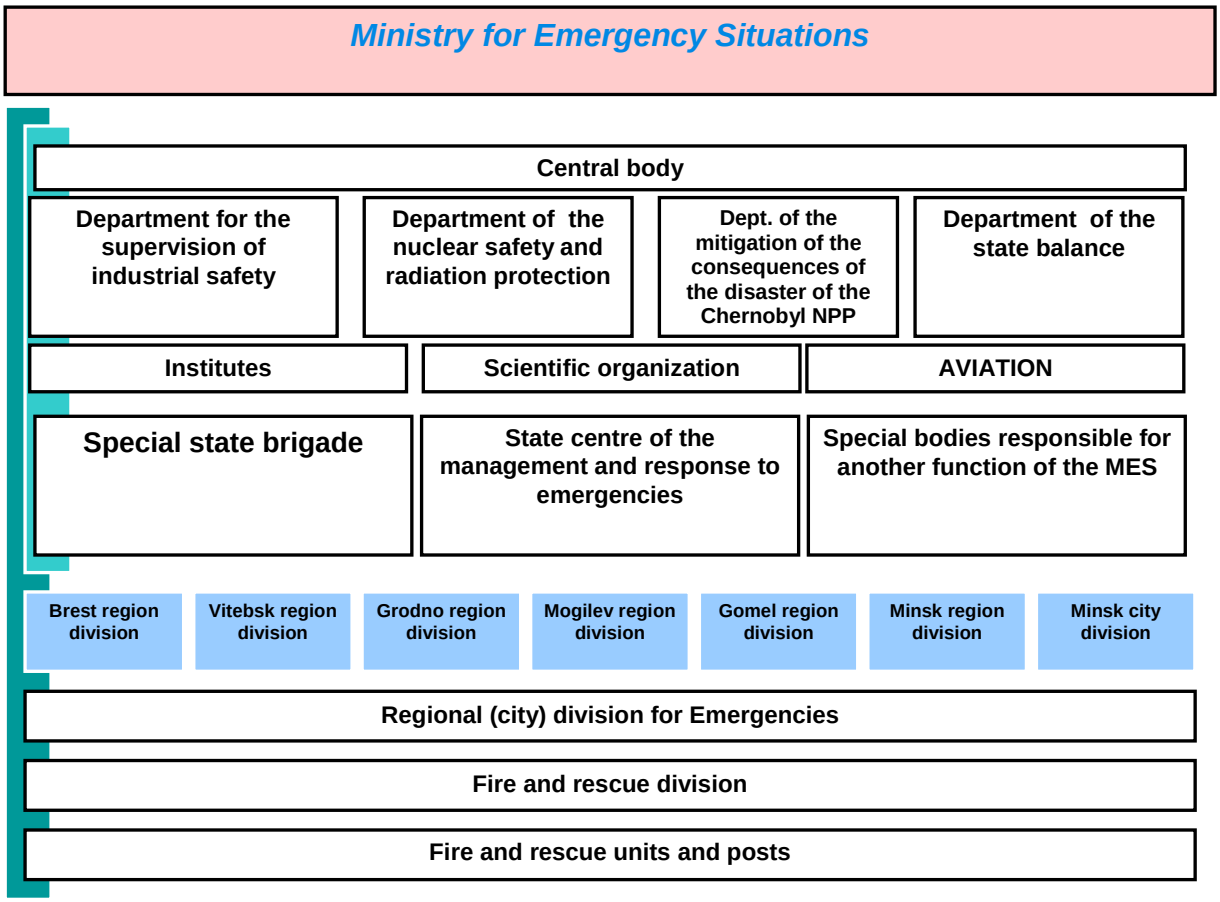


Scheme of activating a response to radiation emergency

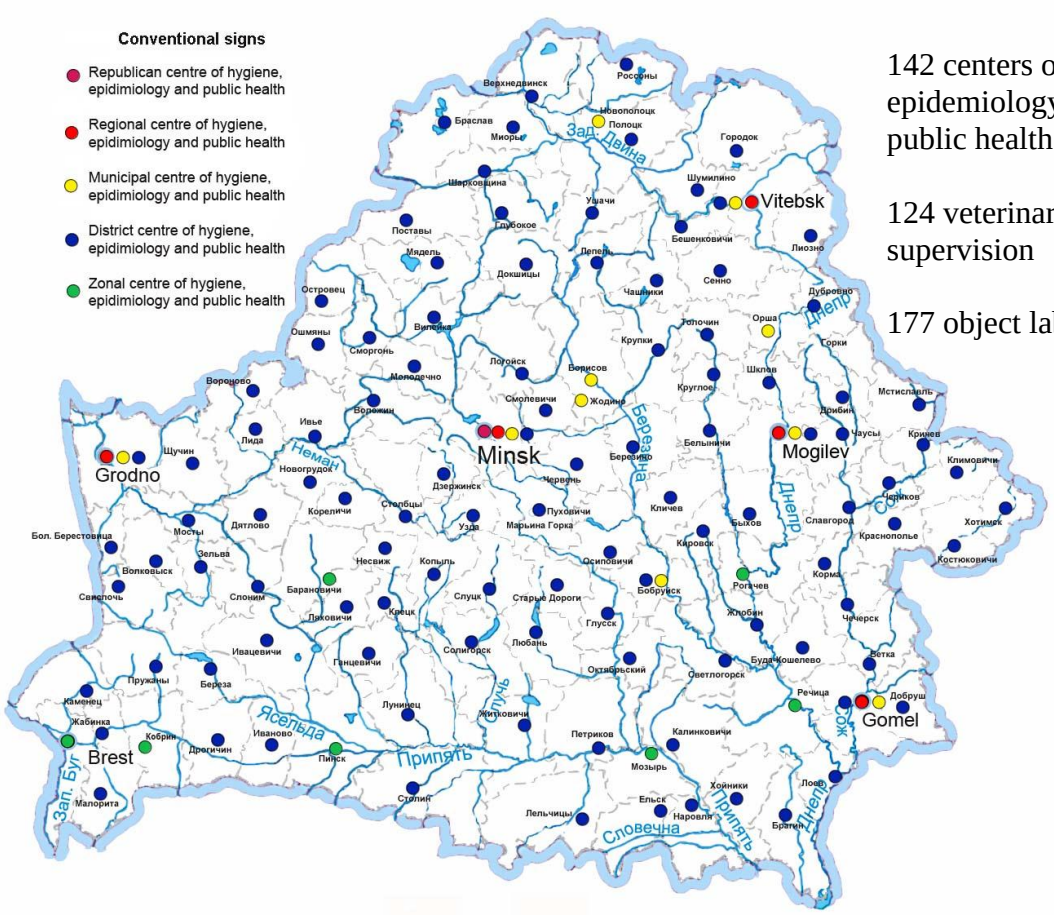


Services of MES related to prevention and emergency response

Organization structure of MES



Network of laboratory control capabilities in Belarus

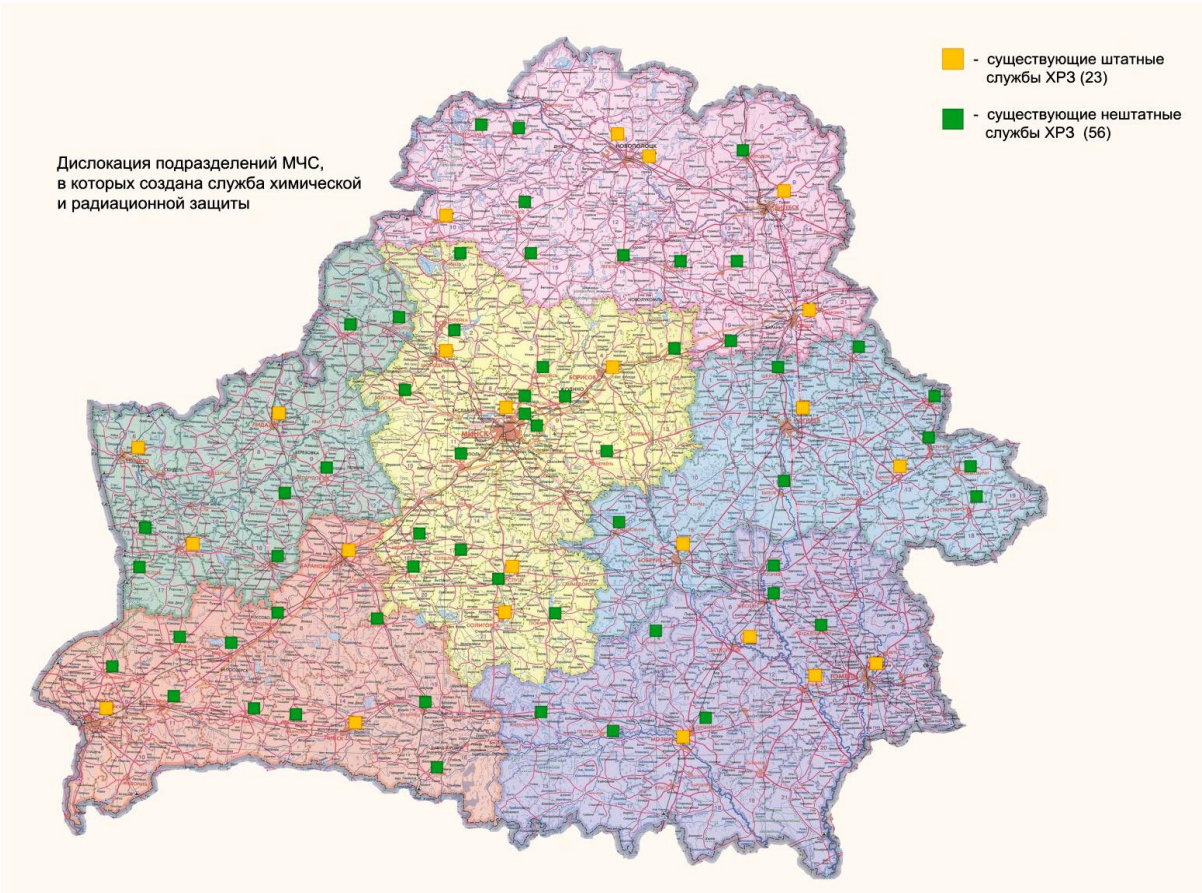


142 centers of hygiene, epidemiology and public health

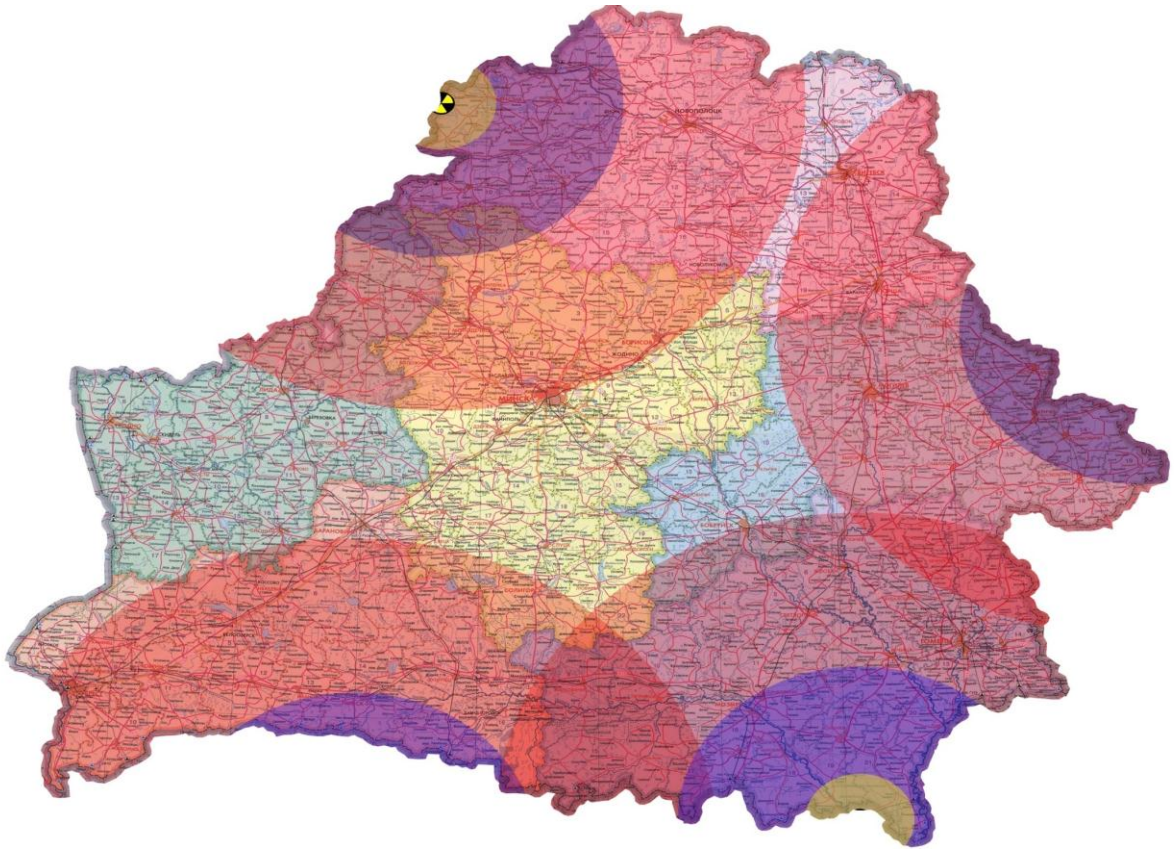
124 veterinary posts of supervision

177 object laboratories

Locations of centers with radiation and chemical protection capabilities within the structure of MES



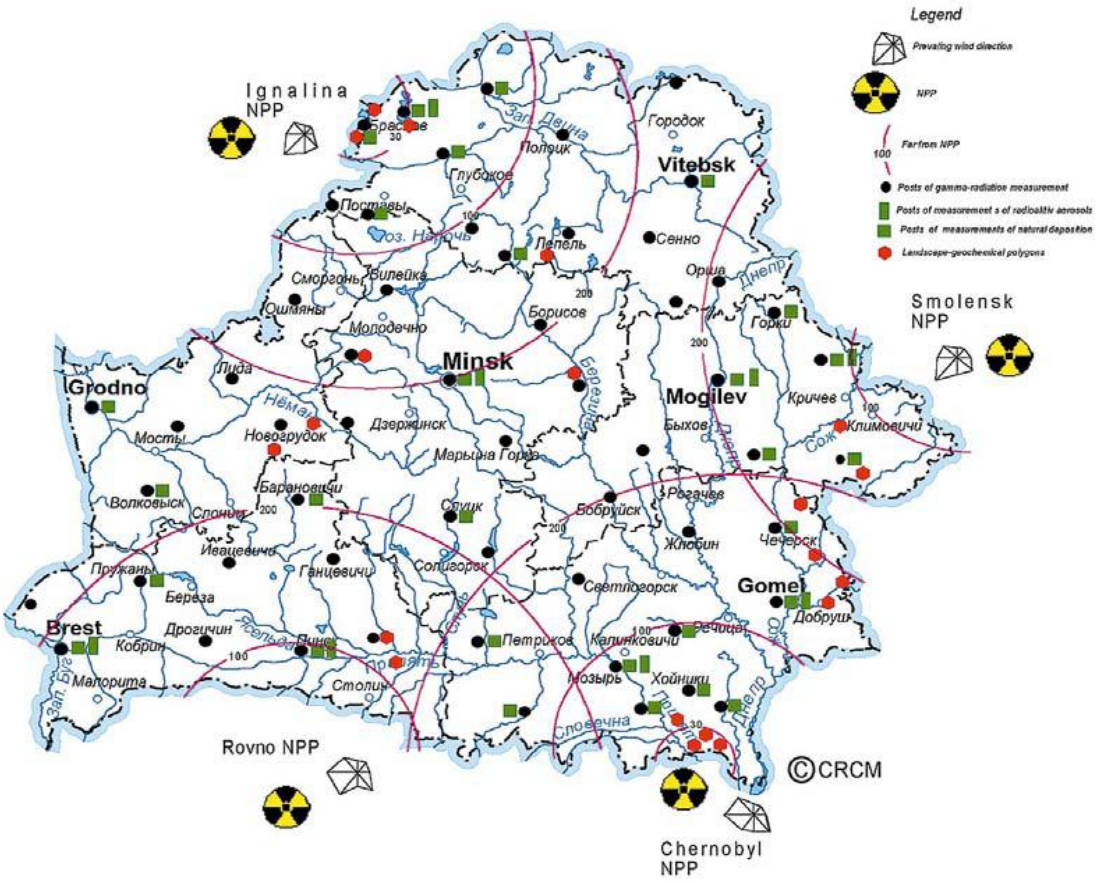
Map of emergency planning zones around NPPs of neighboring to Belarus countries



Network of regular environmental monitoring

Measurement of:

- ✓ gamma-dose rate at 56 posts; 4 automated systems in the zones of influence of Chernobyl, Smolensk, Rovensk and Ignalina NPP
- ✓ fallout from the atmosphere at 30 posts
- ✓ radioactive aerosols at 6 posts
- ✓ surface waters at 5 hydrological stations



APPENDIX 7: Regulatory requirements – Levels

REGULATORY REQUIREMENTS

Basic regulatory requirements in the Republic of Belarus are given by the National Radiation Safety Norms (NRB-2000) and in National Basic Sanitary Rules (OSP-2002).

NRP-2000 (APP. 4)
Dose levels at which intervention is expected to be undertaken under any circumstances

Organ or tissue	Projected absorbed dose to the organ or tissue in less than 2 days (Gy)
Whole body	1
Lung	6
Skin	3
Thyroid	5
Lens of the eye	2
Gonads	3
Foetus	0.1

NRP-2000 (APP. 6)
Criteria* for making immediate decisions during initial period of a radiation accident

Protective measures	Prevented dose during the first 10 days, mGy			
	Whole body		Thyroid, lung, skin	
	Level A	Level B	Level A	Level B
Shelter	5	50	50	500
Iodine prophylaxis:				
- adults	-	-	250**	2500**
- children	-	-	100**	1000**
Evacuation	50	500	500	5000

*General emergency with extensive off-site effects at nuclear facilities in neighboring countries; within a short distance there are 4 sites where a nuclear accident could affect the territory of Belarus
**Only for thyroid

NRP-2000 (APP. 7)
Criteria for making decisions on relocation and restrictions to using contaminated food

Protective measures	Avertable effective dose (mSv)	
	Level A	Level B
Restriction to consuming contaminated food and potable water	5 during the first year; annually during the following years	50 during the first year; 10 per annum during the following years
Relocation	50 during the first year	500 during the first year
	1000 during the entire relocation period	

Hygienic requirements for construction and operation of a NPP (Attachment 6)

Generic Intervention Levels for implementation of protective and other measures in case of a radiation emergency

GENERIC INTERVENTION LEVELS		EXAMPLE OF PROTECTIVE AND OTHER MEASURES
If the predicted dose exceed the following generic criteria: perform urgent protective and other measures		
Equivalent dose to the thyroid due to radioiodine during first 7 days	50 mSv	Thyroid blocking
Effective dose in first 7 days	100 mSv	Sheltering, evacuation, decontamination, restriction of use of foodstuff, milk and water, Radiation monitoring, Informing public
Effective dose to infant or embryo in first 7 days	100 mSv	
If the predicted dose exceed the following generic criteria: perform urgent protective and other measures in early phase of an accident		
Effective dose in 1 year	100 mSv	Temporary relocation, decontamination, provision of clean product, milk and water , informing public
Effective dose to infant or embryo during maternity period	100 mSv	
If the absorbed dose exceed the following generic criteria: Perform long-term medical measures to diagnose and treat radiation induced illnesses		
Equivalent dose in 1 month	100 mSv	Control and medical examination of organs, consultation regarding possible consequences
Equivalent dose to infant or embryo during maternity period	100 mSv	Consultation for implementation of individual measures in individual cases

NRP-2000 (APP. 8)
Generic action levels for foodstuff

RADIONUCLIDE	PRODUCTS, KBQ/KG	
	level A	level B
I-131, Cs-134, Cs-137	1	10
Sr-90	0,1	1.0
Pu-238, Pu-239, Am-241	0.01	0.1

Hygienic requirements for construction and operation of a NPP (Attachment 12)

Operational Intervention Level for protective measures in case of a radiation emergency

OIL	Protective measure
1 µSv/h and more	Prohibiting the use of local foods (including milk) and water from open reservoirs and wells, pending the results of laboratory studies. Restriction of stay for the population in the zone of radioactive contamination in the detection of uncontrolled sources of ionizing radiation (including in transport accidents)
50 µSv/h and more	Shelter and / or (only in case of accidents at nuclear facilities), blocking the thyroid gland
100 µSv/h and more	Limitation of stay of persons, involved in the elimination of radiation accidents (including transport) and consequences, on the contaminated territory within the zone of radioactive contamination in case of the detection of uncontrolled sources of ionizing radiation
200 µSv/h and more	Consideration of the temporary relocation of the population
500 µSv/h and more	Conduct evacuation

Hygienic requirements for construction and operation of a NPP (Attachment 8)
Emergency zones and radius sizes for NPPs with a VVER-type reactor with more than 1000MW installed capacity

ZONES OF EMERGENCY RESPONSE	RADIUS OF ZONES OF EMERGENCY RESPONSE, KM
Precautionary action zone	3-5
Urgent protective action planning zone	25
Food restriction planning zone	300

Hygienic requirements for construction and operation of a NPP (Attachment 9)
Generic Action Levels (GALs) for foodstuffs

RADIONUCLIDES	GENERIC ACTION LEVEL (KBQ/KG)
Food destined for general consumption	
Cs-134, Cs-137, I-131, Ru-103, Ru-106, Sr-89	1
Sr-90	0,1
Am-241, Pu-238, Pu-239, Pu-240, Pu-242	0,01
Milk, infant food and potable water	
Cs-134, Cs-137, Ru-103, Ru-106, Sr-89	1
I-131, Sr-90	0,1
Am-241, Pu-238, Pu-239, Pu-240, Pu-242	0,001

Hygienic requirements for construction and operation of NPP (Attachment 11)
Recommended Emergency Workers Guidance Levels

Tasks	Dose level (1)
Lifesaving actions	Ten times the dose limit of occupational exposure during a single year $H_p(10)$ (2) < 500 mSv This dose level may be exceeded only if the benefit to others clearly outweigh the risks for rescue and emergency workers who voluntarily agree to participate in the protective measures, recognizing and accepting the risk to which they may be exposed
Measures to prevent severe deterministic health effects and action to prevent the development of catastrophic conditions	Ten times the dose limit of occupational exposure during a single year $H_p(10)$ < 500 mSv
Measures to prevent large collective doses	Two times the dose limit of occupational exposure during a single year $H_p(10)$ < 100 mSv

Note:
(1) These values can be used only in case of exposure to external ionizing radiation.
(2) HP(10) - the individual dose equivalent.

APPENDIX 8: OSP-2002, Content of Chapter 26 (English summary)

Radiation safety in a radiation emergency

270. The system of radiation protection for personnel and the public in a radiation emergency should ensure minimizing the negative consequences of the accident, prevention of deterministic effects and minimizing the probability of stochastic effects. Upon identification of a radiation accident urgent action should be taken to stop its development, to re-establish control over the source of radiation and to minimize radiation doses and the number of exposed persons (both personnel and the public) contamination of facilities and the environment, economic and social losses caused by the accident.

271. In the design documentation of the potential radiation accidents caused by equipment malfunction of the object to be identified, improper personnel actions, natural disasters or other causes that may lead to loss of control over the sources of radiation exposure and of people and (or) contaminated environment. The list of possible accidents for the particular working conditions with radiation sources should be approved by the authorities performing state sanitary supervision.

272. In the project documentation of the radiation facilities of categories I-II engineering civil defense measures, measures to prevent emergencies, including the range, volume and storage of personal protective equipment, medical supplies, emergency supplies of radiometric and dosimetric equipment, decontamination and sanitation, tools and equipment needed to carry out urgent works on eliminating the consequences of radiation accidents should be included.

273. User of ionizing radiation sources should develop and have adopted and approved by the local authorities, state authorities responsible for management, supervision and control in the field of radiation safety, the "Plan of Action for the Protection of Personnel and the Public in the Event of a Radiation Emergency." The plan should contain the following sections:

- Forecast of possible accidents at radiation facilities, taking into account the possibility of emergency, types and scenarios of the accident development, as well as the predicted radiation situation for accidents of different types;
- Criteria for decisions on protective measures;
- A list of organizations with whom to cooperate during the response to the accident and its consequences;
- Organization of emergency radiation monitoring;
- Assess the nature and extent of a radiation accident;
- Procedures for the introduction of an emergency plan into action;
- Procedures for notification and information;
- Duties of staff during an accident;
- Duties of responsible persons during emergency operations;
- Measures to protect personnel during emergency operations;
- Fire prevention measures;
- Measures to protect the people and the environment;
- Medical assistance to injured;
- Measures to localize and eliminate areas with radioactive contamination;
- Preparedness and training of the staff responding to an emergency.

274. At all radiation facilities "Instruction on the actions of personnel in emergency situations" should be in place.

275. At the sites, sanitary inspection and a health center first-aid tools should be ensured.

276. In every organization, in which the radiation accidents are possible, a system for emergency alert should be established, for the signals the staff must act in accordance with the plan of measures to eliminate the radiation accident and the "Instruction on the actions of personnel in emergency situations."

277. In case of a radiation accident the administration of the organization shall immediately inform the state authorities responsible for management, supervision and control in the field of radiation safety, as well as local government and local authorities, the population in the areas with possible increase of radiation and the superior organization or department.

278. Local executive and administrative organs in accordance with the "Action Plan for the Protection of Employees (personnel) and the population in the event of a radiological accident" ensure urgent availability of data about the radiation accident from specialists in radiation protection and their participation in informing the public about radiation accidents, recommended ways and about the protection.

279. To perform work to mitigate an accident and its consequences, especially members of the specialized emergency teams must especially be involved. If necessary to perform these functions, preferably staff over 30 without medical contraindications, who have agreed in written informed about the possible radiation doses and health risks, should be involved. Women may be allowed to participate in emergency operations only in exceptional cases.

280. Before starting work on eliminating the accident consequences, personnel should be instructed on radiation safety to explain the nature and sequence of tasks. If necessary, preliminary testing of the forthcoming operations should be conduct.

281. Work on eliminating the accident consequences and performing other measures related to possible overexposure of personnel should be under the radiation control, which defines the maximum duration of work, additional protection. The applicable form is given in Appendix 15 to the Regulation.

282. Regulation of the planned increased exposure to personnel in emergency response is determined by Chapter 5 of the PRB-2000.

284. People with traumatic injuries, chemical poisoning or exposed to a dose above 0.2 Sv should be sent for medical examination and treatment. In the case of a radioactive contamination decontamination of people and clothing should be carried out.

285. When a radiation accident with release of radionuclides into the environment causing the contamination of large areas the protection of the population is carried out in accordance with the criteria for decisions given in Section V, NRB-2000.

286. The elimination of the accident consequences and the investigation into these consequences is conducted according to the law.

287. In the territories contaminated by a radiation accident the following steps should be implemented:

• Radiation monitoring with estimated population exposure doses due to radioactive contamination, if this dose could exceed 10 μSv / year;
• Radiation monitoring of the main types of public exposure;
• Optimized dose reduction for all major types of radiation, if the dose of the population due to radioactive contamination exceeds 1.0 mSv / year;
• Optimized protective measures do not violate the normal functioning of the population or economic and social functioning of the territory, if the radiation dose due to radioactive contamination exceeds 0.1 mSv / year, but is not more than 1,0 mSv/year.

288. For organizations engaged in economic activities in the territories affected by radioactive contamination, the limit of exposure to workers is 5 mSv/year, due to radioactive contamination.

In organizations where the exposure of workers due to accidental contamination exceeds 1 mSv / year, a service for radiation protection should be established, which performs radiation monitoring and conduct activities to reduce exposure of workers.

The order of radiation monitoring is coordinated with authorities and agencies within the state sanitary supervision system.

APPENDIX 9: OSP-2002, Content of Chapter 27 (English summary)

Medical Radiation Safety

289. Medical radiation safety of personnel and the population exposed includes medical examination (physical), disease prevention, and, if necessary, treatment and rehabilitation of persons who have identified changes in health status.

290. Everyone working with ionizing radiation sources (staff) must pass the preliminary and periodic medical examinations according to the rules of the central governmental authority in charge of health care.

291. Employees who have not passed a medical examination are not permitted to work.

292. People living in areas declared as zones of radioactive contamination should pass a medical examination in the manner prescribed by the applicable law.

293. In cases where staff may be exposed to other harmful factors (physical, chemical, biological and other) measures of health protection should take into account the combined effects of these factors.

297. The medical institutions providing specialized medical care to victims of accidental exposure must have:
• radiation monitoring devices;
• means of decontamination of the skin, burns and wounds (when working with open radioactive substances).

299. Medical examination of the public exposed to radiation in one year effective dose of 200 mSv or cumulative dose of 500 mSv from one of the main sources of exposure, or 1000 mSv from all sources of exposure, organized by the territorial health authority.

300. In order to assess the effects of ionizing radiation on the health of workers and the public by the state authority in charge of healthcare, a state dosimetric registry should be established.

APPENDIX 10: Emergency plans and procedures (example)

Preparedness for response to a radiological emergency at SOSNY

The emergency plan at SOSNY consists of 17 sections:

1. Introduction
2. General conditions
3. Prediction of radiation emergencies
4. Criteria for decision making and protective measures
5. List of organizations participating (with existing cooperation) at mitigation of radiation emergencies and their consequences
6. Organization of emergency radiation control
7. Assessment of type and size of radiation emergency
8. Procedure on implementation of emergency plan
9. Procedure on notification and provision of information
10. Action of personnel in case of emergencies
11. Duties of responsible persons during the implementation of emergency response
12. Fire protection measures
13. Protective measures for the public and the environment
14. Provision of first aid to the injured
15. Measures on localization and mitigation of radioactive contamination
16. Preparedness and training of personnel for emergency situations.
17. Appendices

Note: Plans and procedure were presented during the visit to SOSNY. Plans and procedures are regularly exercised (several times a year and at different facilities; plans exist for exercises both on- and off-site).

APPENDIX 11: Self-Assessment sheet prepared by the Republic of Belarus

Self-assessment (SA) check list provides a means for Member States to assess their level of compliance with the international requirements for preparedness and response for a nuclear or radiological emergency [2].

The following table provides the SA provided by the EPREV counterpart.

Task No.	Brief description	Possible IAEA Input			Self-assessed status	
		D[2]	WS[3]	O[4]	P[5]	Comments
01.	**Basic responsibilities**					
	1.1. Establish a governmental body or organization (or identify an existing one) to act as a national coordinating authority (NCA)				3	The existing legislation (Law on use of Atomic Energy (2008), Law on the Public Radiation Protection (1998), Law on Protection of the Public and Territories from Emergencies of Natural and Man-made character (1998) empowers the Ministry of Emergency Situations of the Republic of Belarus (MES) to act as a competent authority for the management of all disasters and accidents including nuclear and radiation emergencies.
	1.2. Clearly assign the functions and responsibilities of operators and response organizations and ensure they are understood by all response organizations				3	The functions and responsibilities of each state body involved in emergency preparedness and response are assigned in the Government Resolution Responsibilities of ministries and other authorities in the field of protection of the public and territories against natural and industrial emergencies (amended Dec. 2005).The functions and responsibilities of operators and response organizations in case of nuclear or radiological emergency at the NPP of neighboring countries are determined by the National Plan for protection of the public and territory from radiation emergencies (i.e. NREP), approved in March, 2007The responsibilities of the organizations in case of emergencies involving orphan radioactive sources are defined by the Instruction on interaction between national state authorities, other state organizations, subordinated to the Council of Ministers, local executive authorities and other organizations in case of detection of radiation sources (approved by the Council of Ministers of the Republic of Belarus, April

2 Documents: TECDOC, Safety Standards, etc.
3 Workshops and training
4 Expert mission, scientific visit, equipment, etc.,
5 Expert mission, scientific visit, equipment, etc.,

						2006).
	1.3. Establish a regulatory and inspection system that provides reasonable assurance that emergency preparedness and response arrangements are in place for all facilities/practices				3	The regulatory and inspection system is operational. It provides that all facilities/practices must have their verified emergency plan in place. Compliance with the emergency preparedness requirements is inspected on different levels of the licensing process by inspectors of the department GOSATOMNADZOR (incorporated in the MES) and by inspectors of the regional divisions of MES and of the Ministry of Health.
02.	**Assessment of threats**					
	2.1. Perform threat assessments of the facilities and activities in the State, categorizing them in accordance with the five threat categories in Table I of GS-R-2				2	Threat assessments of the facilities and activities have been performed but not in line with the threat categories in Table I of the GS-R-2. The OSP-2002 requires that design documentation of the facility must include the list of potential radiological accidents and the emergency plan is consistent with the threat coming from of the potential accidents. The Plan shall be coordinated with the MES and other bodies concerned. The national Register of radiation sources is completed; it is maintained by the GOSATOMNADZOR.
03.	**Establishing emergency management and operations**					
	3.1. Make arrangements to coordinate the emergency responses of all the off-site response organizations with the on-site response to include a command and control system for the local and national response to any nuclear or radiological emergency				3	Coordination of emergency responses of off-site response organizations with on-site response organizations is to be implemented by the Commissions for Emergencies, functioning at facility, local, regional and national levels within the framework of the uniform State System of Prevention and Elimination of Emergencies of Natural and Industrial character (SSPEE).The SSPEE unites all the bodies authorized to take preventive and elimination measures in the event of an accident and consists of permanent-basis functional and regional (territorial) subsystems. The arrangements to coordinate the emergency responses between are also included in the National Plan for protection of population and territory from radiation emergencies (i.e. NREP), approved in March, 2007.
04.	**Identifying, notifying and activating**					
	4.1. Establish a contact point operating 24 hours/day and 7 days/ week				3	Currently in the Republic of Belarus there are two local (Mozir and Braslav), one regional (Gomel) and 1 national (Minsk) 24hours/7days contact points for receiving and processing information on emergencies. The Republican Emergency Management and Response Center under the MES acts as a country level contact point for all response actions (manned 24 hours a day and 7 days a week).
	4.2. Ensure that on-site managers of scrap metal				2	All national border crossings are now equipped with systems of radiation control.

	processing facilities and responsible officials at national borders are aware of indicators of radiation emergency and are able to take immediate actions					Scrap metal processing facilities are obliged to conduct measurements of radioactivity levels of the collected material. The Instruction on interaction between national state authorities, other state organizations, subordinated to the Council of Ministers, local executive authorities and other organizations in case of detection of radiation sources (approved by the Counsel of Ministers of the Republic of Belarus, April 2006) defines the responsibilities of the on-site managers and the relevant state authorities concerning immediate response actions in case a dangerous source has been detected.
	4.3. Ensure that first responders are aware of the indicators of a radiation emergency and they are familiar with the appropriate notification procedures and other immediate actions warranted if an emergency is suspected				2	In most cases, the first response actions are performed by the personnel of the MES rescue teams and divisions which are aware of the symptoms and immediate actions warranted if an emergency is suspected. Additional arrangements, in particular with respect to the organization of regular training of potential first responders are needed.
	4.4 Establish a system for promptly initiating an offsite response in the event of an emergency				3	The system has been established and operational. MES is the responsible authority to maintain the system.
	4.5. Ensure response organizations have sufficient personnel				3	Sufficient personnel are available. The training is conducted by the Command-engineering Institute and by the Institute for Retraining and Professional Development of MES staff, operated under the MES.
	4.6. Make known to the IAEA and to other States the country's single warning point of contact responsible for receiving emergency notifications and information from other States and information from the IAEA				2	Republican Emergency Management and Response Centre of the MES (REMRC) is designated to be a single warning point of contact responsible for receiving emergency notifications and information from other States and information from the IAEA.
05.	**Taking mitigatory actions**					
	5.1. Make arrangements to provide expertise and services in radiation protection promptly to local officials and first responders responding to actual or potential emergencies involving practices in threat category IV				2	The relevant arrangements are established by the Instruction on interaction between national state authorities, other state organizations, subordinated to the Council of Ministers, local executive authorities and other organizations in case of detection of radiation sources (approved by the Counsel of Ministers of the Republic of Belarus, April 2006). The expertise and services in radiation protection to local officials and first responders can be promptly provided by the appropriated institutions of the Academy of Science and the Ministry of Health of the Republic of Belarus.

	5.2. Ensure that the operator of a practice in threat category IV is given basic instruction to be able to mitigate the consequences of the emergency situation				2	All the information concerning the response and notification is included in on-site emergency response plan, which any operator of a practice in threat category IV has to develop according to legislation.
	5.3. Make arrangements to initiate a prompt search and to issue a warning to the public in the event of the loss of a dangerous source				2	According to regulation an operator should immediately notify the Ministry of Internal Affairs, Gosatomnadzor and SES of any lost radioactive material. The appropriate arrangements are established by the above stated Instruction. They are included in on-site emergency response plan, which has to be developed by any operator, dealing with a dangerous radioactive source.
	5.4. Make arrangements for mitigatory actions to prevent the escalation of the threat; to return the facility to a safe and stable state; to reduce the potential for releases of radioactive material or exposures; and to mitigate the consequences of any actual releases or exposures				2	According to regulation (OSP -2002) the on-site emergency response plan of the facility shall describe the appropriate mitigatory actions and procedures. The off-site mitigatory actions are considered in the NREP (2007).
06.	**Taking urgent protective action**					
	6.1. Adopt national intervention levels for taking urgent protective actions in accordance with the relevant international standards				3	Values of Generic intervention levels are specified in the National Safety Standards (NRB-2000) for two (A and B) levels. In general they are in good compliance with international standards, but not exactly the same as those in Annex III of the GS-R-2.
	6.2. Make arrangements for effectively making and implementing decisions on urgent protective actions to be taken off the site				2	The appropriate arrangements with respect to urgent protective actions in case of the emergency at the NPP of the neighboring countries are included in the NREP (2007).
	6.3. Make arrangements to ensure the safety of all persons on the site in the event of a nuclear or radiological emergency				2	According to OSP-2002 every facility should have "Emergency response plan" and "Instruction on Actions of the Personal in the Event of Emergency Situations". The licensees have responsibility for ensuring availability of the appropriate alarm systems, protection and communication means, etc.
07.	**Providing information and issuing instructions and warnings to the public**					
	7.1. Make arrangements to provide prompt warning and instruction to the permanent, transient and special population groups or				2	The appropriate arrangements are included in the NREP (2007). The detailed information is not available.

	those responsible for them and to special facilities in the emergency zones upon declaration of an emergency class					
08.	**Protecting emergency workers**					
	8.1. Make arrangements for taking all practicable measures to provide protection for: 1) emergency workers in threat category I, II or III or within the precautionary action zone or the urgent protective action planning zone; 2) radiation specialists, radiation protection officers, emergency team of radiological assessors and medical personnel who may respond to radiation emergencies				3	Requirements on protection for emergency workers and all other specialists involved in respond to the emergency are determined by the National Safety Standards (NRB-2000), Law "On Rescue Service and Status of Rescuer" (2001) and other subordinated regulations. No worker undertaking an intervention should be exposed in excess of the maximum single year dose limit for occupational exposure (50 mSv) except for the purpose of saving lives and/or preventing people from overexposure. In last cases workers should be male-volunteers over 30 years old, who have consented to doing the job in writing after being informed of possible exposure doses and associated health risks. Arrangements are in place for handling emergencies involving dangerous orphan sources. The MES special team is equipped with all necessary protection equipment and was trained to undertake emergency response in hazardous conditions.
09.	**Assessing the initial phase**					
	9.1. Establish default operational intervention levels (OILs) for radiological emergencies				3	The National Safety Standards (NRB-2000) establishes default operational intervention levels (OILs) of dose for acute exposure by organ or tissue and generic action levels for foodstuffs which are consistent with those given in Annex II and III of the No GS-R-2.OILs for temporary relocation and resettlement are included in the new NREP (2007)
10.	**Managing the medical response**					
	10.1. Make arrangements for general practitioners and emergency staff to be made aware of the medical symptoms of radiation exposure and of the appropriate notification procedures if a nuclear or radiological emergency are suspected				2	General practitioners and emergency staff seem to be aware of the medical symptoms of radiation exposure due to the experiences, gained after the Chernobyl Accident. Educational Programs of the State Medical Universities and of the International State University named after Sakharov include the relevant topics.
	10.2. Make arrangements at the national level, to provide initial treatment of people who have been exposed or contaminated				2	The medical part of the national Emergency Response Plan has been drawn up. The Republican Scientific Centre of Radiation Medicine and Human Ecology (GOMEL) is designated to accept casualties. It has a detailed response plan and procedures, including arrangements for request of international assistance. Within frame of the USEPES the Ministry of Health has

						developed a National Service for sanitary treatment of victims of mass casualty and create special medical teams with a backlog of materials and supplies for providing medical care in case of mass casualty events (disasters). There are one national and 6 regional Centers of Emergency Medicine under this system.
11.	**Keeping the public informed**					
	11.1. Make arrangements for providing useful, timely, truthful, and consistent information to the public, responding to incorrect information and rumors and responding to requests for information from the public and from news and information media				2	The information for the population is realized by the mass media and through a press centre that is established under the headquarters for emergencies for communication with population. Depending on their levels, public relation issues are to be set in on-site emergency plans and emergency response plans of relevant territorial and functional subsystems of the USEPES.
12	**Taking agricultural countermeasures, countermeasures against ingestion and longer term protective actions**					
	12.1. Adopt national intervention levels and action levels for agricultural countermeasures				3	The National Safety Standards (NRB-2000) establishes generic action levels for foodstuffs which in general are consistent with those given in Annex III of the No GS-R-2. OILs for dose rates due to deposition and deposition densities were developed with regard to the situation after the Chernobyl Accident and should be reviewed.
	12.2. Make arrangements, concentrating on the use of existing capabilities, for taking effective agricultural countermeasures				2	The NREP (2007) includes taking agricultural countermeasures and defines duties, responsibilities and rights of the Ministries and authorities to be involved in taking the appropriate actions. The arrangements are based on the Chernobyl experience and include restriction of the consumption, distribution and sale of locally produced foods, timely monitoring for ground contamination, sampling and analysis of food and water, etc. There are special recommendations and instructions, which need to be reviewed and updated to be totally consistent with the international requirements.
13.	**Mitigating the non-radiological consequences of the emergency and the response**					
	13.1. Make arrangements for responding to public concern in an actual or potential nuclear or radiological emergency				2	Depending on their levels, responding to public concerns in an actual or potential radiological emergency are to be set in emergency response plans of relevant territorial and functional subsystems of the USEPES.
14.	**Requirements for infrastructure**					
	14.1. Develop emergency plans that are consistent with he threat and coordinated with all				3	On the level of operator the task to develop and implement the facility "Emergency response plan" is defined in Basic Sanitary

	response organizations					Regulations on radiation safety requirements (OSP-2002) and it is required by the licensing procedure. The National Radiation Emergency Plan (2007) has been developed with due account to risk of radiological contamination resulting from accidental fall-out of radionuclides at the NPP of neighboring countries.
	14.2. Ensure that operating and response organizations develop the procedures needed to perform their response functions				2	Procedures have been developed and are included in the relevant emergency response plans. There is a need for further review/amendment of the instructions and co-ordination procedures.
	14.3. Provide, concentrating on the use of existing capabilities, adequate tools, instruments, supplies, equipment, communication systems, facilities and documentation				2	These issues are covered by a licensee emergency plans and response plans of relevant territorial and functional subsystems of the SSPEES. The functional arrangements and capabilities needed to implement these plans in proper way are being upgraded in the process of implementation of the special programs on ensuring functioning of the SSPEES elements which exist on the both functional (branch) and territorial levels. According to the report from the counterpart there are shortages in equipment and lack of adequate documentation.
	14.4. Identify facilities at which the following will be performed: coordination of on-site response actions; coordination of local off-site response actions (radiological and conventional); coordination of national response actions; coordination of public information; and coordination of off-site monitoring and assessment				3	Coordination) of on-site response actions (operator level) - commissions for emergencies of the appropriate enterprise and organization b) of local off-site response (at local territorial level) - commissions for emergencies under the regional and local executive bodies c) of national response actions - Commission for Emergencies under the Council of Ministers d) of public information is conducted by officials, assigned to be responsible for communication with the public and mass media. e) of off-site monitoring is performed by Republican Centre of Radiological Control and Monitoring (RCRMC) of the Ministry of Environment
	14.5. Make arrangements, concentrating on the use of existing capabilities, for the selection of personnel and training				2	A multi-level educational and training system is in place. This provides for ensuring that personnel assigned to positions with responsibilities for emergency response are adequately trained. Educational Foundations of the SSPEE and MES include Institute for Retraining and Professional Development of the MES Command-Engineering Institute (Minsk located) Gomel Engineering Institute (Gomel located)
	14.6. Conduct exercises and drills to ensure that all specified functions required to be performed for emergency response				2	Emergency exercises are conducted at all levels of the SSPEES on regular basis according to the approved schedule. The local and facility level drills and exercises are conducted annually. There is an annual

	and all organizational interfaces for facilities in threat category I, II or III and the national level programs for threat category IV or V are tested at suitable intervals					exercise for testing the emergency system of radiation monitoring which has been created as the SSPEES to unite capabilities of the surveillance systems and laboratories of various organizations in case of nuclear or radiological emergency. National and regional capabilities and organizational interfaces in case of response to potential or actual emergency at the NPP of neighboring countries must be tested at intervals defined by the new NREP (2007).Regional exercises titled "Organization of public and territory protection in the event of potential or actual emergency at the Ignalina NPP" were conducted in 2002 in four regions: (Mogilev, Grodno, Minsk and Brest).In November 2009 the regional exercise "Organization of public and territory protection in the event of potential or actual emergency at the Smolensk NPP is scheduled to be conducted jointly with MES of Russian Federation.
	14.7. Make arrangements to ensure the availability and reliability of all supplies, equipment, communication systems and facilities needed during an emergency				2	Arrangements (a Quality Assurance Program) to ensure the availability and reliability of all systems and facilities have been under development. Requirements are in place that: the emergency response plans and procedures as well as training programs for their testing shall be reviewed on the regular basis; lessons and experience learned during the exercises shall be discussed and registered and then used to make necessary modification or improvements.

Table 7 Performance indicators for the self-assessment check list

PI GRADE	DEFINITION
3	Appraisal criterion is fully met.
2	Appraisal criterion is partially met – and an action plan is implemented to fully meet the criterion within a defined time scale.
1	Appraisal criterion is not met – and actions are under way to make improvements, but these will not achieve full compliance with the criterion.
0	Appraisal criterion is not met -and no significant efforts are being made to improve the situation.

The task numbers in the table below describe the macro-processes to get an interim basic response capability. In the left “column PI” introduces performance indicators specified by the members of the current expert mission (*EM*) and in the right there are PI put by Belarus counterparts (*UC*).

APPENDIX 12: Abbreviations

The abbreviations below are for the purposes of this report only

ABBREVIATION	DESCRIPTION
MES	Ministry for Emergency Situations of the Republic of Belarus
MH	Ministry of Health of the Republic of Belarus
GOSATOMNADZOR	Department on Nuclear and Radiation Safety of MES (National Nuclear Regulatory Authority)
NREP	National Radiation Emergency Plan
EPREV	Emergency Preparedness Review
IAEA	International Atomic Energy Agency
NRB-2000	Belarus National Radiation Safety Norms
OSP-2002	Belarus National Basic Sanitary Rules on Ensuring Radiation Protection
IRDP	Institute for retraining and professional development of MES
REMRC	Republican Emergency Management and Response Centre of MES
CEI	Command and Engineering Institute of MES
SSPEES	State System for Prevention and Elimination of Emergency Situations
GIL	Generic Intervention Level
GAL	Generic Action Level
OIL	Operational Intervention Level
MI	Ministry of Interior of the Republic of Belarus
MD	Ministry of Defense of the Republic of Belarus
MNREP	Ministry of Natural Resources and Environmental Protection of the Republic of Belarus
SCC	State Custom Committee of the Republic of Belarus
CBS	Committee of Border Security of the Republic of Belarus
SOSNY	State Scientific Agency “Sosny”
RSRT	Republican Special Response Team
DBA	Design Basis Accidents
BDBA	Beyond Design Basis Accidents
PIC	Public Information Centre

APPENDIX 13: Composition of the IAEA EPREV team

Peter ZOMBORI IAEA, Team Leader	Emergency Preparedness Officer, IAEA NS-IEC
Vera STAROSTOVA Czech Republic	Head, Emergency Response Centre, State Office for Nuclear Safety
Albinas MASTAUSKAS Lithuania	Director, Radiation Protection Centre
Karol JANKO Slovakia	Vice Chairman, Nuclear Regulatory Authority

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GLOSSARY

arrangements (for emergency response). The integrated set of infrastructure elements necessary to provide the capability for performing a specified function or task required in response to a nuclear or radiological emergency. These elements may include authorities and responsibilities, organization, coordination, personnel, plans, procedures, facilities, equipment or training.

emergency. A non-routine situation or event that necessitates prompt action, primarily to mitigate a hazard or adverse consequences for human health and safety, quality of life, property or the environment. This includes nuclear or radiological emergencies and conventional emergencies such as fires, release of hazardous chemicals, storms or earthquakes. It includes situations for which prompt action is warranted to mitigate the effects of a perceived hazard.

emergency class. A set of conditions that warrant a similar immediate emergency response. This is the term used for communicating to the response organizations and the public the level of response needed. The events that belong to a given emergency class are defined by criteria specific to the installation, source or practice, which if, exceeded indicate classification at the prescribed level. For each emergency class, the initial actions of the response organizations are predefined.

emergency classification. The process whereby an authorized official classifies an emergency in order to declare the applicable emergency class. Upon declaration of the emergency class, the response organizations initiate the predefined response actions for that emergency class.

emergency plan. A description of the objectives, policy and concept of operations for the response to an emergency and of the structure, authorities and responsibilities for a systematic, co-coordinated and effective response. The emergency plan serves as the basis for the development of other plans, procedures and checklists**.**

emergency preparedness. The capability to take actions that will effectively mitigate the consequences of an emergency for human health and safety, quality of life, property and the environment.

emergency procedures. A set of instructions describing in detail the actions to be taken by response personnel in an emergency.

emergency response. The performance of actions to mitigate the consequences of an emergency for human health and safety, quality of life, property and the environment. It may also provide a basis for the resumption of normal social and economic activity.

emergency services. The local off-site response organizations that are generally available and that perform emergency response functions. These may include police, fire fighters and rescue brigades, ambulance services, and control teams for hazardous materials.

emergency worker. A worker who may be exposed in excess of occupational dose limits while performing actions to mitigate the consequences of an emergency for human health and safety, quality of life, property and the environment.

exposure. The act or condition of being subject to irradiation. Exposure can be either external exposure (irradiation by sources outside the body) or internal exposure (due to a source within the body).

first responders. The first members of an emergency service to respond at the scene of an emergency.

generic intervention level. The level of avertable dose at which a specific protective action is taken in an emergency or situation of chronic exposure.

generic action level. The concentration (Bq/g) of specific isotopes in food or water at which consumption should be restricted if replacement food or water is available.

intervention. Any action intended to reduce or avert exposure or the likelihood of exposure to sources which are not part of a controlled practice or which are out of control as a consequence of an accident.

intervention level. The level of avertable dose at which a specific protective action is taken in an emergency or situation of chronic exposure.

longer term protective action. A protective action, which is not an urgent protective action. Such protective actions are likely to be prolonged over weeks, months or years. These include measures such as relocation, agricultural countermeasures and remedial actions.

non-radiological consequences. Effects on humans or the environment that are not deterministic or stochastic effects. These include effects on health or the quality of life resulting from psychological, social or economic consequences of the emergency or the response to the emergency.

notification.

(1) A report submitted promptly to a national or international authority providing details of an emergency or potential emergency, for example as required by the Convention on Early Notification of a Nuclear Accident;

(2) A set of actions taken upon detection of emergency conditions with the purpose of alerting all organizations with responsibility for emergency response in the event of such conditions.

notification point. A designated organization with which arrangements have been made to receive notification (meaning 2 in this glossary) and to initiate promptly predetermined actions to activate a part of the emergency response.

nuclear or radiological emergency. An emergency in which there is, or is perceived to be a hazard due to:

(a) the energy resulting from a nuclear chain reaction or from the decay of the products of a chain reaction; or
(b) radiation exposure.

off-site. Outside the site area.

on-site. Within the site area.

operational intervention level (OIL). A calculated level, measured by instruments or determined by laboratory analysis, that corresponds to an intervention level or action level. OILs are typically expressed in terms of dose rates or of activity of radioactive material released, time integrated air concentrations, ground or surface concentrations, or activity concentrations of radionuclides in environmental, food or water samples. An OIL is a type of action level that is used immediately and directly (without further assessment) to determine the appropriate protective actions on the basis of an environmental measurement.

operator (or operating organization). Any organization or person applying for authorization or authorized and/or responsible for nuclear, radiation, radioactive waste or transport safety when undertaking activities or in relation to any nuclear facilities or sources of ionizing

radiation. This includes private individuals, governmental bodies, consignors or carriers, licensees, hospitals, and self-employed persons. It includes those who are either directly in control of a facility or an activity during use (such as radiographers or carriers) or, in the case of a source not under control (such as a lost or illicitly removed source or a re-entering satellite), those who were responsible for the source before control over it was lost.

practice. Any human activity that introduces additional sources of exposure or exposure pathways or extends exposure to additional people or modifies the network of exposure pathways from existing sources, so as to increase the exposure or the likelihood of exposure of people or the number of people exposed.

radiation emergency. A nuclear or radiological emergency.

radiological emergency. An emergency involving an actual or perceived risk from activities that could give rise to a nuclear or radiological emergency at an unforeseeable location. These include non-authorized activities such as activities relating to dangerous sources obtained illicitly. They also include transport and authorized activities involving dangerous mobile sources such as industrial radiography sources, radio thermal generators or nuclear powered satellites.

regulatory body. An authority or a system of authorities designated by the government of a State as having legal authority for conducting the regulatory process, including issuing authorizations, and thereby regulating nuclear, radiation, radioactive waste and transport safety.

response organization. An organization designated or otherwise recognized by a State as being responsible for managing or implementing any aspect of an emergency response.

source. Anything that may cause radiation exposure — such as by emitting ionizing radiation or by releasing radioactive substances or materials — and can be treated as a single entity for protection and safety purposes. For example, materials emitting radon are sources in the environment, a sterilization gamma irradiation unit is a source for the practice of radiation preservation of food, an X ray unit may be a source for the practice of radiodiagnosis; a nuclear power facility is part of the practice of generating electricity by nuclear fission, and may be regarded as a source (e.g. with respect to discharges to the environment) or as a collection of sources (e.g. for occupational radiation protection purposes). A complex or multiple installations situated at one location or site may, as appropriate, be considered a single source for the purposes of application of international safety standards.

threat assessment. The process of analyzing systematically the hazards associated with facilities, activities or sources within or beyond the borders of a State in order to identify:

(a) Those events and the associated areas for which protective actions and emergency countermeasures may be required within the State; and
(b) The actions that would be effective in mitigating the consequences of such events.