

GENERAL REQUIREMENTS TO PHYSICAL PROTECTION SYSTEMS OF NUCLEAR FACILITIES

*The present draft of the technical code is not applicable prior to its
approval*

*Ministry of Emergency Situations
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INTRODUCTION

The objectives, basic principles, provisions on government regulation and management in the sphere of technical rate setting and standardization established by Law of the Republic of Belarus "On technical rate setting and standardization"

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Introduction

This technical code of common practice is developed within a framework of the state program “Scientific support of nuclear power energetics development in the Republic of Belarus for 2009-2010 and for the period until 2020” approved by the resolution of the Council of Ministers of the Republic of Belarus of August 28, 2009 No. 1116 with the following requirements:

- Convention on the Physical Protection of Nuclear Material of October 26, 1979
- Law of the Republic of Belarus of July 30, 2008 № 426-3 "On the use of atomic energy",
- Regulations on Physical Protection of the Objects of Use of Atomic Energy approved by the Decision of the Council of Ministers of the Republic of Belarus of September 27, 2010 №1385.

IAEA recommendations that set forth in INFCIRC/225/Rev. 4 (Corrected) “The Physical Protection of Nuclear Material and Nuclear Facilities” (IAEA, Vienna, 1999) taking into account during development of the present technical code of common practice

During development of the present technical code of common practice the following norms and rules of the Russian Federation that regulating the requirements to the physical protection of nuclear materials, nuclear installations and points of storage were studied:

- “Regulations on Physical Protection of Nuclear Materials, Nuclear Facilities and Nuclear Material Storage Facilities”, approved by Resolution of the Government of the Russian Federation No. 456 of July 19, 2007;
- “Requirements to Physical Protection Systems of Nuclear Materials, Nuclear Facilities and Nuclear Material Storage Facilities”, approved by the Federal Service for Ecological, Technological and Nuclear Supervision of Russia No. 7 of December 27, 2001.

ПОЛОЖЕНИЯ ОБ ОБЩИХ ТРЕБОВАНИЯХ К СИСТЕМАМ ФИЗИЧЕСКОЙ ЗАЩИТЫ
ЯДЕРНЫХ ОБЪЕКТОВ

ПАЛАЖЭННІ АБ АГУЛЬНЫХ ПАТРАБАВАННЯХ ДА СІСТЭМ ФІЗІЧНАЙ ЗАБЯСПЕКІ
ЯДЗЕРНЫХ АБ'ЕКТАЎ

General Requirements to Physical Protection Systems of Nuclear Facilities

Effective date

1 Scope of application

1.1 This technical code of common practice (hereinafter referred to as the “technical code”) sets out requirements to complex of technical and organizational measures to prevent unauthorized activities threaten the security of nuclear materials, nuclear facilities and nuclear material storage facilities.

1.2 Requirements of the present technical code apply to the physical protection systems of nuclear materials, nuclear facilities and nuclear material storage facilities at all stages of their construction (improvement) and operation according to [1].

1.3 Breach of the present technical code is punishable in accordance with the statutory procedure.

2 Normative references

In the present technical code references to the following technical normative legal acts (hereinafter – TNLA) in the field of technical rate setting and standardization are used:

TCP 097-2007 (02300) Placement of nuclear power plants. Main criteria and requirements to safety provision.

TCP 5.1.01-2004 National system of conformity confirmation of the Republic of Belarus. Basic provisions.

TCP 5.1.10-2004 National system of conformity confirmation of the Republic of Belarus. The order of register maintaining

TCP 45-1.03-59-2008 (02250) Acceptance of completed construction facilities. The procedure

TCP 45-2.04-154-2009 Construction norms of design. Natural and artificial lighting

TCP 28-2.02-2008 Alarm systems. Technological charts of regulations of technical procedures

TCP 28-2.03-2008 Control and management systems of access. Technological charts of regulations of technical procedures

TCP 28-2.04-2008 Television security systems. Technological charts of regulations of technical procedures

TCP 28-3.05-2008 Television security systems. Rules of production and acceptance of work

TCP 28-3.06-2008 Tactics of use of alarm systems.

TCP 28-3.07-2008 Alarm systems. Rules of production and acceptance of work

TCP 28-3.11-2008 Control and management systems of access. Rules of production and acceptance of work

TCP xxx-20xx (2300) Physical protection system of nuclear materials and nuclear installations. Instruction on the organization of design

TCP xxx-20xx (02300) Physical protection system of nuclear materials and nuclear installations. Requirements to design decisions

STB 125-2000 Protection of facilities and private persons. Terms and definitions

STB GOST P-51241-2003 Control and management systems of access. Classification. General technical requirements. Test methods

STB GOST P-51558-2003 Television security systems. General technical requirements and test methods

STB 1.03.02-96 Structure, procedure of development and coordination of project documentation in construction

STB 1.02.03-97 Procedure of development, coordination, approval and structure of justification

investments into construction of the enterprises, buildings and structures

Note – Using the present technical code it is advisable to check TNLA according to the catalogue made as of 1 January of the current year and according to the corresponding information signs, published in the current year.

If the references TNLA are replaced (changed), the use of the present technical code should be guided by the replaced (changed) TNLA. If the references TNLA are repealed without replacement, regulation with it reference is applied in part that does not affect on this reference.

3 Terms and definitions

In the present technical code the following terms with the corresponding definitions are used:

3.1 particularly important area: the area located in the interior area and contains equipment, systems, devices, nuclear material, spent nuclear material, exploitation radioactive waste material, and considering that unauthorized actions against them may create threat to the health or life of people as a result of radiation exposure or to lead to radioactive contamination of the environment

3.2 protected area: the area under protection and supervision surrounded by physical barriers to which access is limited and controlled.

3.3 access: a duly issued permit to carry out certain work or receive certain documents and information.

3.4 checkpoint: the place on the perimeter of the protected area, equipped with engineering and technical means and systems for authorized access to its territory.

3.5 control center of physical protection system: a specially equipped place with engineering and technical means and from which designated staff for the physical protection manages the engineering and technical means for the physical protection in normal and emergency situations on the full or partial basis.

3.6 design basis threat: the attributes and characteristics of potential offender against which a physical protection system is designed and evaluated.

3.7 emergency situation: a situation when in the result of unauthorized action on a nuclear facility normal working conditions are breached, causing injury to personnel (population) is possible, a threat to the life of personnel (population) is appeared, and also damage to the environment may be possible.

3.8 entrance: entry (passage) in protected areas, buildings, structures, rooms of nuclear facility.

3.9 interior area: area located in the protected area in which nuclear material, spent nuclear material, exploitation radioactive waste material are used and (or) stored to which access is limited and controlled; surrounded with physical barriers and is constantly being under protection and supervision

3.10 item of physical protection: nuclear materials, including products based on them, the nuclear installation and (or) its vulnerable elements identified in the analysis of vulnerability; carriers of secret information about nuclear facility and the item of physical protection, about the organization, composition and operation of the physical protection system; other systems and communication elements of a nuclear facility, the need to prevent unauthorized actions in respect of which the vulnerability was revealed in the process of analyzing.

3.11 limited access area: an area that does not contain nuclear materials and weak points of nuclear installations to which access is limited and controlled.

3.12 nuclear facility: an enterprise (organization) in which nuclear material is used or stored, or where nuclear installation or storage facility is located and (or) operated.

3.13 offender: a person who commits unauthorized action, as well as a person assisting him in doing so.

3.14 physical barrier: a physical obstruction that inhibits the movement of people to protected area, interior area or particularly important area.

3.15 rule of two persons: principle of teamwork, based on the requirement for simultaneous presence of at least two persons with appropriate privileges (in one workplace) to reduce the possibility of unauthorized actions.

3.16 secrecy degree: indicator of the importance of state secrets that defining measures and means of protection of state secrets

3.17 secure area: a protected, interior or particularly important area.

3.18 security service: a structural unit of a nuclear facility designed to organize and monitor implementation of measures on providing physical protection, and to perform other special functions.

3.19 threat: a set of conditions and factors creating possibility of unauthorized actions or a person with intentions and capabilities to commit unauthorized actions.

3.20 trace control strip: a strip of the area, which surface in its natural state or after special processing provides fixation of traces and its long term preservation.

3.21 unauthorized action: committing or attempt to commit nuclear theft, sabotage of nuclear installation, storage facility, unauthorized access to nuclear installation, storage facility, carrying (transportation) on nuclear facility and at the storage facility of prohibited items, inactivating or malfunction of engineering and technical means of physical protection.

3.22 violator's model: a set of information about size, equipment, readiness, awareness and tactics of offenders, their motivation and goals, which are used to formulate requirements for the physical protection system and evaluation of its effectiveness.

3.23 vulnerability analysis: the process carried out by the operating organization to identify areas of vulnerability based on the accepted design threat and possible ways of implementation of the unauthorized actions.

3.24 vulnerable places: the places of use and storage of nuclear materials; spent nuclear material, exploitation radioactive waste materials, as well as separate elements of systems, equipment, devices, nuclear installation devices and (or) storage facility, and considering that unauthorized action against them may lead to an emergency situation, or create threat to the health or life of people as a result of radiation exposure or to lead to radioactive contamination of the environment.

4 Symbols and abbreviations

AMCS – access monitoring and control system;

AS – alarm system;

AWM - automatized working place

CCU – central control unit;

CDC IT MIA - the Central Department of the Commander of Interior Troops of the Ministry of Internal Affairs of the Republic of Belarus

CP – checkpoint

CTS – component technical specification;

CU – control unit;

CUA – consequences of unauthorized actions;

ES– explosive substances;

IDC – inter-departmental commission;

LAZ – limited access zone;

LCU – local control unit;

MES – Ministry for Emergency Situations of the Republic of Belarus;

NF – Nuclear Facility;

NI – nuclear installation.

NM – Nuclear Material;

OESS - electro-optical surveillance system

PA – protected area;

PB – physical barrier;

PP – physical protection;

PPETF – physical protection engineering and technical facilities;

PPS – physical protection system;

PPSt – physical protection subject;

RCWS - rapid communication and warning system

SF – storage facility;

SPTA - set of spare parts tools and accessories

SS – Security Service;

SSC – The State Security Committee of the Republic of Belarus;

TCS – trace control strip;

TMPP – technical means of physical protection;
TS – technical specification;
UA – unauthorized actions;
IT MIA - Internal Troops of the Ministry of Internal Affairs of the Republic of Belarus
WD – warning device;

5 General provisions

5.1 In the present technical code main purposes and objectives of physical protection systems of NF are defined and directed at UA prevention against NM, their storage facilities and NI.

5.2 The present technical code establishes requirements for elements of PPS NF: personnel, guard forces, organizational and technical procedures and complex of PPETF.

5.3 On the basis of the requirements of the present technical code local normative legal acts of NF should be developed.

6 Purpose and objectives of physical protection system

6.1 Purpose of physical protection system

6.1.1 The purpose of PPS is to prevent UA to nuclear materials, nuclear installations and other items of NF physical protection.

PPS is considered as a set of organizational and technical procedures conducted by the NF administration, its security service, security departments (personnel of PPS) with the use of engineering and technical means of physical protection.

PPS is a part of a common system of organizational and technical procedures implemented on NF to ensure security activity on use of atomic energy and keeping of nuclear materials.

6.1.2 Taking into account its characteristics, items of physical protection should incorporate the following:

- nuclear materials which include products based on them;
- nuclear installations, storage facilities and their weak elements identified in the vulnerability analysis;
- carriers of the secret information about NI and PPSt, about organization, composition and operation of the PPS;
- other systems, elements and communications of NF, the need to prevent of UA that identified in the course of vulnerability analysis.

6.1.3 The purpose of PPS is achieved by creating and maintaining a unified system of measures aimed at problems solution of PPS.

6.2 Objectives of physical protection systems

6.2.1 PPS is designed to implementation of the following basic tasks:

- prevention of unauthorized actions;
- prompt detection of unauthorized actions or its signs;
- hindering (slowing down) the intrusion (advancement) of offender;
- responding to unauthorized actions of offenders and their neutralization in order to prevent the unauthorized actions.

6.2.2 Prevention of UA is achieved by the following means:

- the organization of access of NF employees (personnel), seconded officials and visitors to NO (NI, SF, NM)
- the organization of admission to NF (NI, SF, NM);
- the equipment of secure areas PPETF;
- implementation of the rule of two persons working in particularly important areas, as well as in other cases, requiring the use of group work in order to reduce the possibility of unauthorized access;
- informing the local population and employees (personnel) of NF about the responsibility for UA in accordance with the statutory procedure;
- the identification of persons involved in the UA preparation.

6.2.3 Prompt detection of UA or their attempts is achieved by:

- providing protection of the perimeters of guarded areas, CP and separate structures;
- the use of alarm systems, technical detection device which are located on the perimeter of guarded areas, buildings, structures, rooms, and may also be located inside structures, rooms;
- the use of electro-optical surveillance systems that monitor the perimeters of guarded areas, checkpoints, guarded buildings, structures, rooms and access to them;
- inspection of the personnel, seconded officials, visitors and their items including the use of detection device of carrying NM, ES and metal items;
- prompt detection of planned inactivation (attempts of inactivation) of PPETF;
- supplying access mode and intrabuilding mode on NF;
- installation and operation of PPETF in strict accordance with design and operational documentation;
- monitoring of condition and working capacity of PPETF;
- providing the training, explanatory work and preventive action for the detection of UA and alerting of response forces by personnel of NF.

6.2.4 Hindering (slowing down) the intrusion (advancement) of an offender is achieved by:

- installation of physical barriers on possible routes of offender intrusion to the place of UA committing, that allows to delay the offender long enough for the arrival of the guard forces;
- implementation by the guard forces and SS of hindering advancement of offenders to the place of UA.

6.2.5 Responding to UA and offenders neutralization to prevent UA is achieved by:

- actions of the guard forces and if it is necessary external response forces to prevent unauthorized actions to secure areas in accordance with the plan of the NF guard and the procedure established by normative legal acts;
- the suppression of the offenders actions that penetrated into a secure area by the guard forces, SS and employees (personnel) of NF in accordance with the procedures established by the plan of interaction between the NF administration, SS and guard units in normal and emergency situations, as well as job descriptions of the physical protection personnel and duty services;
- the interaction between the administration, security service and NF guard units with the state security bodies and internal affairs to detain offenders when they are preparing to commit UA ,terrorist acts, as well as carrying out investigative work for recovery of stolen NM and products based on them.

6.2.7 In addition to the main objectives within the PPS and for their effective solutions, the tasks must be implemented on:

- the development of legal and normative support of PSS;
- the NF vulnerability analysis and evaluating the effectiveness of PPS, preparation based on these proposals on improvement of PSS;
- information security in PPS;
- providing training of the PPS staff for the solution of PPS tasks;
- the involvement of engineering and technical means.

7 General principles of physical protection system formation

7.1 General provisions

7.1.1 Principles of PPS formation are aimed at achieving of its effectiveness. PPS should provide the required effectiveness which is determined by the ability of PPS to resist unauthorized actions of offenders in regard to NM, NI and other PPSt and the list of threats and offenders' model for a particular NF defined at the stage of vulnerability analysis should be considered.

7.1.2 In the construction of PPS the following principles should be guided:

- zone construction;
- strength balance;
- ensuring of reliability and casualty control
- additivity
- performance monitoring regularity
- adequacy

7.1.3 Requirements to the creation and organization of PPS operation are established on the basis of abovementioned provisions.

7.2 Principle of zone construction of the physical protection system

7.2.1 Depending on located and operated on the territory of the NF, NM, NI and other PPSt, the physical protection system should provide the organization and creation of protected areas, providing "layered" protection PPSt.

7.2.2 At NF should be allocated both areas in which NI are placed and / or NM stored and (or) takes measures with them (protected, internal, and particularly important areas), and areas access to which is limited due to the location of elements inside of them that are vital to the facility and its safety systems, but where NM and NI do not exist (limited access areas).

7.2.3 In accordance with the assigned categories, PPSt should be placed in the respective secure areas. At the organization of the NF zoning, strengthening of physical protection from the periphery to the center, i.e. to protect PPSt should be provided. If in the process of evaluating the effectiveness of PPS becomes clear that existing secure areas is not enough to neutralize potential threats, there may be organized additional secure areas (boundaries) in the existing zones or PPSt that are located in other secure areas.

Requirements for PPSt categorization are defined in section 8 of the present technical code.

7.3 Simultaneous-failure-mode approach

7.3.1 The required level of effectiveness of PPS for all types of offenders that identified in the analysis of vulnerability, ways of UA committing and traffic routes should be provided. PPS strength balance should be provided from the point of the:

- prevention of an unauthorized access;
- detection of unauthorized access committing;
- suppression of UA and detention of offenders for various situations;
- information leakage.

The required level of PPS effectiveness must be specified in the creation and improving of PPS, taking into account the category of NF and the criterion "efficiency-cost".

7.3.2 Strength balance of PPS should be provided around the perimeter of the secure area (for a given categorized rooms or groups of rooms), including secure passages and (or) CP.

7.4 Principle of reliability and casualty control

7.4.1 PPS should be able to perform tasks in normal and emergency situations, as well as in conditions of emergency situations at NF within design basis accidents and elimination of its consequences.

7.4.2 In order to ensure the survivability of PPS in normal and emergency situations in the complex of PPETF, should be selected a group of engineering and technical means used for the physical protection of a separate secure area and its categorized rooms. To manage the operation of mentioned group of PPETF should be created a local control unit with all necessary elements of display and communication and providing possibility to provide physical protection of the secure area in the autonomous mode.

7.4.3 Organization of exploitation of engineering and technical means should provide the implementation of a preventive maintenance system.

7.4.4 The selection and verification activities should be carried out to nuclear weapons personnel, training, preparation of SS NF personnel and the personnel of the guard units to action in normal and emergency situations.

7.4.5 Element redundancy of PPS should be provided. Redundancy of certain functions may be implemented through compensatory measures (with the use of personnel, technical and organizational measures). For communication and data transmission, redundant channels should be provided, including the use of alternative (wearable, light, sound, etc) communication tools.

7.4.6 Breach of the operation of certain elements of the PSS should not lead to violations of the operation of the PPS as a whole. To improve the reliability and survivability of PPS, the appropriate technical solutions and organizational measures should be used.

7.4.7 PPS should be built on the basis of the following unified modules to ensure their compatibility with the functioning of the PPS:

- structural;
- constructive;
- logical;

- informative;
- electromagnetic, etc.

7.5 Additivity concept

7.5.1 PPS should be able to adapt to the following changes:

- threats and models of offenders;
- in the configuration of the boundaries of secure areas of NF;
- types and methods of protection;
- placing of items of physical protection.

7.5.2 PPS should be able to form additional boundaries of physical protection.

7.5.3 The PPS should combine different ways of staging (removing) the perimeters of buildings, structures, rooms under the protection of both the automatic and manual modes.

7.5.4 PPS should not interfere with the operation of NF and to adapt to the technological features of its work, including emergency situations, taking into account the action taken on nuclear, radiation, technological and fire safety.

7.6 Principle of performance monitoring regularity

7.6.1 Control of physical protection is carried out at the state, departmental levels and at the level of NF.

7.6.2 In order to determine the effectiveness of PPS and working out issues of cooperation, teachings should be carried out periodically, and the effectiveness of PPS should evaluate by analytical and other methods. Results of effectiveness should be used to improve the PPS.

7.6.3 Notification of any cases of unauthorized actions in relation to NF must be immediately reported to the operating organization (OO) and interested state bodies in accordance with their competence. The facts of the emergency situations in the PPS should be reported to NF.

7.6.4 Complex of TMPP should be composed of components and integral elements, which allows exercising permanent remote monitoring of condition and working capacity of PPETF and functioning of the PPS as a whole.

7.7 Principle of adequacy

Organizational and administrative measures that adopted on NF as well as technical ways to implement the PP must conform to the accepted threats and models of offenders.

The implementation of the principle of adequacy is provided by means of the:

- analysis of NF vulnerability
- categorization of NF, PPSt and places of their storage and use;
- choice of structure and composition of PPETF;
- identifying ways of protection and defense of NF;
- evaluation of the effectiveness of PPS;
- use in creation and improvement of PPS "efficiency-cost" criterion;
- ability to apply compensatory measures.

8 Categorization of nuclear facilities

8.1 General provisions

8.1.1 Categorization of NF is an established procedure for the distribution of nuclear facilities by types and categories to differentiate requirements for PPS.

8.1.2 In the process of categorization of NF each PPSt must be attributed to the corresponding category. As the criteria for categorization of PPSt should be considered the following:

- the category and significance of NM;
- the degree of secrecy of PPSt;
- the category of consequences of UA against PPSt.

8.2 Nuclear materials category

8.2.1 According to [2], NM category is a characteristic of NM from the point of view of its significance. NM category determined by type, concentration, degree of exposure and the mass of NM in accordance with Appendix A.

8.2.2 The importance of the NM is determined by the degree of possibility of its use for the manufacture of a nuclear explosive device.

The number of NM that is sufficient to manufacture of a nuclear explosive device, represents a significant number of NM.

8.2.3 According to the degree of possibility of the use for the manufacture of a nuclear explosive device or its components, NM are divided into:

- nuclear materials of direct use, i.e. materials that can be used without additional processing and without any conversion or enrichment, but with little additional physical or chemical treatment;
- nuclear materials of indirect use, i.e. materials that cannot be used without additional enrichment and physical-chemical transformations.

8.3 Secrecy degree of items of physical protection

Secrecy degree of PPSt is determined according to [3], [4] and technological regulations for the protection of information.

8.4 Unauthorized actions consequences categories

8.4.1 In the process of assessing the scale of CUA should be made a qualitative assessment of the boundaries of the territory, which may be subject to nuclear and radiation effects as a result of implementation of external and internal threats in respect of certain PPSt (taking into account possible UA with respect to other PPSt, including ensuring the safety of NF). Assessing the CUA scale is the attribution of consequences to one of three categories in accordance with Appendix B.

8.4.2 SNSD I category includes those that may lead to radiative exposure that covers several regions or fall outside the borders of the Republic of Belarus.

8.4.3 SNSD II category includes those that may lead to radiative exposure that fall outside sanitary protection zone of NF

8.4.4 SNSD III category includes those in which radiation exposure is limited to the territory of the sanitary protection zone of NF

8.4.5 An approximate estimate of borders of the territory, which may be covered with radiation exposure during the committing acts of sabotage by offenders against PPSt, is determined at NF with regard to the current radiation safety standards (sanitary regulations) with the assistance of specialized organizations if it is necessary.

8.4.4 The results of the assessment of the CUA scale should be drawn up as a separate document approved by the head of NF, and be presented in the OO to determine the category of NF with other material of categorization of NF.

8.5 Categorization of items of physical protection

8.5.1 Category PPSt is determined on the basis of applying the appropriate criterion of categorization of PPSt or a set of criteria. PPSt should be located in secure areas according to their categories. Categories of PPSt and requirements for the location of the PPSt in the appropriate secure areas listed in the Appendix B

8.5.2 Providing if PPSt classified to the category B or G in accordance with Appendix A and has two or more criteria, then the category can be enhanced.

8.5.3 Providing if the only criteria of PPSt is the degree of secrecy, its placement in the limited access area inside the protected area is allowed.

8.5.4 The category of rooms, buildings, structures is determined as the maximum category of presented PPSt. When several PPSt placed in one room, it is necessary to consider their combination in determining of the building category.

8.5.5 The results of categorization of PPSt, rooms, buildings, structures, and their attribution to secure areas should be drawn-up as a separate document approved by the head of NF.

8.6 Categorization criteria of nuclear facilities

8.6.1 Categorization of NF is carried out in order to differentiate the requirements to the PPS and a decision on the inclusion of NF in the list of items protected by internal troops of the MIA.

8.6.2 Criteria of NF incorporate the:

- category of PPSt located at NF;
- type of NF (power reactors, research NI, storage facilities of NM).

If NF may be attributed to several types, it should be taken the type of nuclear facility that identifies a higher category of NF.

8.6.3 The following categories of nuclear facilities are established taking into account the categorization criteria:

- I NF Category – nuclear facilities, which contain PPSt of Category A among other PPSt;
- II NF Category – nuclear facilities which contain PPSt of Category B;
- III NF Category – nuclear facilities which contain structures and complexes with energy, experimental and research reactors, critical and subcritical nuclear benches, not attributed to I and II categories; other nuclear facilities, not attributed to I and II categories, on which are located the PPSt of categories B and G;
- IV NF Category – nuclear facilities which do not contain PPSt of Categories A – B and thus the theft of NF is unlikely due to their physical-chemical properties, condition and form, specific of their storage and use.

8.7 The procedure for categorization of nuclear facilities

8.7.1 Categorization of NF carried out by the operator and based on the results of proposals review on assignment of the appropriate category of NF.

8.7.2 The proposals offered by the administration of NF should incorporate the following:

- list of internal and external threats to NF defined in the process of conducting vulnerability analysis of NF;
- assessment of the scale of CUA in the implementation of threats of NF in accordance with the procedures and criteria set out in 8.4.1 of the present technical code;
- proposals for the attribution of NF to one of the categories listed in 8.6.2 of the present technical code;
- if it is necessary, explanation of increase or decrease categories of NF for various reasons, taking into account specific additional factors and features for a given NF.

8.7.3 During the categorization of NF should be taken into account the following additional factors and peculiarities of NF:

- the specifics of use, production, processing, storage and / or transportation of NF, including physical-chemical state of NI of the technological processes;
- types and characteristics NI exploited at NF;
- structure of NF;
- hours of operation of NF;
- the number of staff, ensuring the functioning of NF;
- proximity to other hazardous facilities, large settlements, state borders, etc.;
- operating conditions of NF (natural conditions, impact of industrial noise etc.);
- other features of NF that affect on the regulation of the requirements for PPS.

8.7.4 List of NF with their category should be established by the operator's order with the requirements of the present technical code and be revised not less than once in five years.

8.7.5 In case of changing of NF functioning conditions by the operating organization it may be decided to change its category. The reason for changing the category of NF may be appropriate proposals of the NF administration as well as the results of departmental control.

8.7.6 Categorization of PPSt should be based on the results of vulnerability analysis of NF in the process of creation and modernization of the PPS, as well as in other cases, when their category may be revised.

8.7.7 Categorization of rooms, where PPSt located, is held in a mandatory manner established by the administration of NF, in order to represent the source data to create and improve PPS. The need and procedure of categorization of buildings and structures is determined by the administration of NF, taking into account features of NF, its secure areas and locations of PPSt.

8.7.8 The list of categorized rooms (buildings, structures) with the persons responsible for compliance with the physical protection requirements in providing works, are set by the head of NF and revised as and when necessary, but not less than once in three years

9 Vulnerability analysis of nuclear facility

9.1 In order to determine the specific internal and external threats, the possible ways of their realization, models of the offender, as well as identifying vulnerable places of NI, SF NM and technical process of use and storage of NF for the following creation of effective PPS on the basis of the results, vulnerability analysis of NF is carried out.

Vulnerability analysis of NF is based on common threats to the nuclear facility and the general model of offender, which are determined by the design threat in the manner required by the MIA.

List of models of external and internal offenders based on the type of NF, its category and features of technological processes of use and storage of NF and put in force by orders or instructions of the operator.

9.3 The operator organizes and carries out formulation of the abovementioned documents and passing them to NF for use in the analysis of vulnerability of specific NF.

9.4 The procedure and conditions of vulnerability analysis should be defined by the operator in the methodical recommendations for conducting vulnerability analysis of NF.

The vulnerability analysis is carried out for all operating NF, as well as for newly designed and reconstructed NF, which will be engaged by designated activity at intervals determined by the local normative legal acts of the operator.

10 Structure of physical protection system

PPS can be presented as a set of the various components and structural components. The main components of PPS in the present technical code are the following:

- the staff of PSS;
- organizational and technical measures;
- complex of PPETF.

10.1 Personnel of physical protection system

10.1.1 In direct participation of PPS management involved:

- administration of the NF represented by the head (Director) or his deputy;
- head of SS NF (the deputy of NF head for safety issues), his or her substitute;
 - head of structural unit of NF (his deputy) and head of the SS unit in the structural unit (of the SS unit that serving this structural unit);
- the commanders and headquarters of the internal affairs bodies and (or) military units (divisions) of internal troops of the MIA represented by the commander and chief of staff;
- the commandants of secured facilities (duty assistants).

10.1.2 Functioning of PPS at various hierarchical levels is provided by:

- the personnel of divisions of SS NF serving NF and centrally implements the main tasks and functions of the PSS;
- the personnel of divisions of SS NF serving structural divisions of NF, which ensure the operation of NI YAU and SF NM.
- staff of divisions of the internal affairs bodies and (or) VV MIA, which are carrying out protection of NF

10.1.3 Organizational structures of PPS management are determined by the local normative legal acts of specific NF, states of divisions of internal affairs bodies and (or) Internal Troops of the MIA, developed separately on the basis of acts of the interdepartmental commission on the organization of protection for each NF, and other normative legal acts

10.2 Organizational arrangements

10.2.1 Organizational and technical measures in the PPS should include a complex of measures conducted by state bodies for regulation of safety at use of atomic energy, exercising control in PPS at all stages of creation, functioning and improvement of the PPS to achieve the purposes and objectives solving of PPS.

10.2.2 The activities at NF are part of efforts to ensure its PP in accordance with the requirements of normative legal acts on provision of physical protection.

The organizational measures in PPS include the development of local normative legal acts of

NF, that taking into account the peculiarities of functioning of PPS of a particular NF - its category, organizational and staffing structure of the SS and guard units, equipment of PPETF, peculiarities of secure areas and others.

10.2.4 The main local normative legal acts of object level incorporate:

- provision on allowing system access and access to NM, NI, SF NM and other PPS, as well as to information on the PPS functioning;
- instructions on access mode;
- provision on intrabuilding regime;
- provision on security service;
- provision on the guard units;
- plan of protection and defense of nuclear facility;
- plan of interaction of administration, security service, personnel of NF, guard units in normal and emergency situations;
- plan of interaction of administration, security service, guard units with the internal affairs bodies and internal troops, state security bodies in emergency situations.
- plans of checking of technical condition and working capacity of PPETF.

Local normative legal acts of an object level should specify the requirements of normative legal acts on the physical protection taking into account the organizational structure, and of the peculiarities of NF functioning and should not contradict them.

10.2.5 Organization of interaction at the level of administration of NF with the divisions of the internal affairs bodies and (or) internal troops which are carrying out protection of NF, as well as with other state bodies that regulate safety at use of atomic energy in regular mode and in emergency situations is carried out in accordance with applicable legislation and registered by the act of IDC at each NF, as well as by the corresponding plans.

10.3 Complex of engineering and technical means of physical protection

10.3.1 Complex PPETF is designed for engineering and technical support of achieving the purposes and objectives solving of PPS. The PPETF complex incorporates:

- engineering means;
- complex TMPP

10.3.2 Complex PPETF should solve the following tasks:

- providing operational and continuous management of PPS;
- providing the established mode of access of the NF personnel;
- difficulty of actions of the offenders trying to get an unauthorized access to secure areas, buildings, structures, rooms;
- reporting to the control points of PPS about attempts and the facts of UA commission;
- determination on perimeter of PA of movement direction of an offender (to the object, from the object), time and place of UA;
- creation of favorable conditions to forces of protection for the implementation of service and fighting tasks and simplification of actions of reserve groups of guards on detention of offenders;
- remote supervision over the perimeters of the secure areas protected buildings, rooms, constructions and a situation assessment;
- provision of maneuver by forces and means at service guard;
- marking of the boundaries of secure and controlled areas;
- registration (documentation) of signals from TMPP, orders and commands given by the governing bodies and the reports of PPS personnel;
- protection of PPS personnel that on duty at the control points, checkpoints, guard posts and tasks implementation on suppression of UA and detention of the persons involved in their commission.

10.3.3 The engineering means of PP include the engineering structures, construction and physical barriers used in PPS NF and on vehicles carrying NM in order to increase the efficiency of PPS, creation of the necessary conditions of security personnel to perform assigned tasks. Engineering means of PPS incorporate the following:

- physical barriers;
- engineering equipment of secure areas and guard checkpoints (TCS, trail outfits (road of guard), trail of PPETF experts, indicating, demarcation and warning signs, drainage constructions);
- protective and defense construction for duty guards;

- equipment of brake platforms, places of service by duty guards on railway platforms;
- engineering equipment of the checkpoints and posts with throughput functions to the protected buildings, constructions, rooms.

10.3.4 Physical barriers designed to prevent passage of people and vehicles into the object (from the object) outside the checkpoint, hindering (slowing down) the intrusion of offenders, limitation or exclusion of the possibility of committing of other UA, as well as monitoring of production territories from outside of the secure areas. PB include:

- building structures of NF (walls, floors, gates, doors)
- fencings (the main fencing of the facility, external and internal fencings of restricted areas, fencings of secure areas);
- engineered barriers;
- means of strengthening of doors, windows, manufacturing holes;
- containers used for transportation and storage of NI;
- anti-collision devices (fixed and portable);
- means of protection of operators of CCU and LCU, duty guards, guards on duty on the checkpoint from attack by small weapon and from sudden attack.

If necessary, the PB PPS may include:

- managed means of delay;
- transport protection devices;
- other physical obstacles.

10.4 Complex of technical means of physical protection

10.4.1 Complex of TMPP is designed for technical support of actions for ensuring physical protection of NF and located (operated) on it NM, NI and SF NM.

10.4.2 Complex of TMPP must perform the following tasks:

- collection, processing, analysis, and control of all information received from TMPP;
 - providing the possibility of assessment of the alarming situation in real time;
 - formation and transmission of messages (the established signals) to forces of protection, reaction forces and governing bodies of PPS;
 - providing information exchange between CCU and LCU, and also with control points and command points of other security systems of NF;
 - elaboration of control actions to the managed physical barriers, and means of ensuring of functioning of PSS;
 - control of a state and working capacity of PPETF
 - control of actions and location of personnel during their work with NM and on NI;
- storage and delivery of information on the functioning of PPS, the attempts of its overcoming and UA to the protected objects and PPETF.

10.4.3 For delivery of requirements to individual components, complex of TMPP should be divided into structural components (functional systems).

Functional system is the part of the PPS (complex of TMPP), which implement the group functions of PPS by appointment to which the corresponding tactical and technical requirements can be delivered.

10.4.4 As a part of the TMPP complex the following main structural components (functional systems) should be allocated:

- the alarm system;
- the warning alarm system;
- the monitoring and control of access;
- the monitoring and appraisal of the situation;
- operational communication and alerting;
- telecommunications;
- the information security;
- the power supply;
- the illumination.

10.4.5 To ensure the management and reliable functioning of the PPS in the complex of TMPP, LCU and CCU may be provided, as well as specialized AWM and technical facilities:

- AWM for carrying out of analytical work;

- AWM for carrying out of technical maintenance;
- AWM of training and retraining of personnel of PPS.

10.4.6 Each of the functional systems can be subdivided into functional subsystems of the next level. The present technical code considers only the top level of division into functional systems. Tactical and technical characteristics and nomenclature of the performed functions of each of the functional systems are determined by technological regulations by standardization. In the present technical code only the main functions are considered which realization the PPS functional systems have to provide.

10.4.7 Technical realization may differ from division into functional systems. The devices used as a part of the TMPP complex of specific NF can provide implementation of requirements delivered to one or several functional systems.

10.4.8 Devices (systems) that provide implementation of requirements to several functional systems, belong to the class of the integrated devices (systems). The integrated devices (systems) should provide full implementation of requirements to devices (systems) of two and more functional systems. In case the device (system) fully implements requirements only of one of functional systems and partially realizes functions of one or several other functional systems, it cannot be referred to the integrated devices (systems), and can be considered only as the device (system) with expanded functionality.

11 Requirements for structural components and elements of the engineering and technical means of physical protection

11.1 Security alarm system

11.1.1 AS is designed to detect attempts and (or) facts of UA and should notify of these events to the PPS personnel, to other functional subsystems of PPS for performance of the appropriate adequate actions, and automatically issue the necessary control commands to the actuating mechanism and secure PB .

11.1.2 AS should provide:

- detection of unauthorized access to the secure areas, buildings, constructions, rooms;
- issue signal on AS operation to personnel and (or) SS and making record of this event;
- maintain an archive of all events occurring in the system, with the recording of all the necessary information for their subsequent unambiguous identification (type and number of device, type and cause of the event, date and time of its onset, etc.);
- eliminate the possibility of uncontrolled disarming/arming;
- carry out functions on assuming (relieving) of a detection device (group of detection devices) under control (from control).

11.2 Alarm-call signaling

11.2.1 ACS is designed for emergency call for response forces, for notification about commission of UA, for issuance of signal of coercion, for control of vital functions of the duty guard, and for control of passage of patrol along predetermined route.

11.2.1 ACS should:

- inform the PPS personnel of any triggering of ACS devices;
- determine the place of call;
- provide secrecy of its installation and convenience in the use of calling device;
- make removal of ACS devices from control impossible;
- provide difference of signals on triggering of ACS devices from signals on triggering of the devices of the AS;
- control the vital functions of operators of control stations, duty guards and controllers who are on duty at the post (by technical means and organizational measures).

Information received by the CCU and LCU from ACS devices should take precedence in being presented to the operator when compared to other signals.

11.2.2 When selecting ACS devices and their installation locations, the following should be considered:

- accepted threats and models of offenders;
- likely routes of the movement of offenders;
- ways of improvement of UA;
- security of personnel of PPS and employees of NF from the influences resulting from

- threats;
- reliability of ACS devices;
- resistance to environment factors.

11.3 Access monitoring and control system

11.3.1 AMCS is designed to control and provide access of personnel (visitors, seconded officials) to NF, and passage of vehicles to (from) rooms, buildings, structures, areas and territories, in accordance with the access mode established at the nuclear facility

11.3.2 AMCS should prevent (or create a maximum possible obstruction) to unauthorized access to the secure areas and rooms. In the event of detection of attempts of unauthorized intrusion, or facts of force impact on the structural elements of AMCS passage devices and terminals, the relevant information should be submitted to the duty official (officials) operator (operators);

11.3.3 In case if special emergency passes are not provided, AMCS passage devices should meet the requirements imposed to emergency passes.

11.3.4 AMCS should provide:

- accessibility for the NF personnel (seconded officials and visitors) and vehicles in accordance with the local normative legal acts of NF;
- prevent to unauthorized access to the territory of secure areas due to arrangement with PPS personnel, and also uncontrolled pass (drive) through the checkpoint ;
- strengthening of requirements for control of access right of persons in the secure areas from protected to particularly important area;
- recording of all actions, including by PPS personnel and by passing persons, and also cases of power impact on passage devices;
- possibility to issue ID cards as for permanent employees of NF and vehicles, and for visitors and seconded officials, at the same time full archive of produced and issued ID cards should be kept.

11.3.5 The design of AMCS devices (human and vehicle checkpoints) should provide emergency manual opening of the devices

11.3.6 ID cards used in AMCS should not contain any information, knowledge and application of which can lead to unauthorized access (personal identification numbers, characteristics and values of biometric parameters and characteristics, and other reference data)

11.3.7 The composition of AMCS at checkpoints should include equipment used for inspection of the passing personnel, seconded officials and transport in order to prevent carrying (transportation) of prohibited items (weapon and other items made of metal, nuclear and radioactive materials, explosive substances, etc.).

11.4 Situation monitoring and appraisal system

11.4.1 The situation monitoring and appraisal system is designed for remote monitoring of approach avenues to protected areas, perimeters and other space areas in order to assess the current situation, monitor the actions and movement of offenders, coordinate the actions of the PPS personnel, as well as to keep a visual archive.

11.4.2 The following elements should be allocated in the situation monitoring and appraisal system:

- the opto-electronic surveillance system;
- devices enabling the duty guards to perform their surveillance functions (binoculars, night vision devices, etc.)

11.4.3 OESS should:

- provide the operator with the necessary and sufficient information about the situation on site and at its protected areas, buildings, structures and rooms;
- provide information for assessment of the situation in case of detection of UA and video confirmation of such unauthorized actions;
- display, record and archive information to the extent necessary for subsequent analysis of emerging abnormal situation;
- provide operational capability under all operation conditions specified in regulatory documents;
- monitor the presence of faults (loss of video signal, equipment rupture, attempts to access communication lines, etc.), informing the operators of control stations about this, and archiving this information.

11.4.4 Information provided by OESS to operators of CCU (LCU) should make it possible to distinguish between the visibility scope of offenders and animals.

11.5 Rapid communication and warning system

11.5.1 RCWS is intended for exchange of voice information between the PPS personnel in order to provide coordinated actions on protection and defence of NF in normal and emergency situations.

11.5.2 RCWS should:

- provide a reliable and continuous operation in the entire territory of NF and in areas near it, in all its buildings, structures and rooms in all possible operation modes, including during intrabuilding transportation of NM;
- carry out accounting and recording of ongoing negotiations indicating their time and duration;
- prevent unauthorized connection of other subscribers to the RCWS and if possible identify, locate and record such facts;
- organize and duplicate communication channels between the security service, guard forces, the state security bodies and internal affairs, MES and OO .

11.5.3 To provide reliable operation, RCWS should incorporate at least two different technologies of connections between subscribers. Alternative methods of establishing communication should be accessible immediately the main method of information sharing breaks down

11.5.4 If it is impossible to establish radio communication in separate areas, buildings and rooms of NF due to technological features, alternative means of two-way communication should be considered.

11.5.5 Requirements to creation, installation and operation at NF of systems and means of radio communication used in PPS, as well as to the information security are determined by the requirements of TNLA for the information security and radio communication.

11.6 Telecommunications system

11.6.1 TCS is designed to provide a reliable information exchange between systems that are part of the PPS.

The TCS equipment should be used when the standard equipment that is part of the functional systems of the PPS does not meet the requirements for transmission of information circulating in the PPS, as well as for docking and harmonization of various systems that are part of the PPS.

11.6.3 TCS should:

- transfer accurate information;
- provide continuity of operations;
- provide tactically acceptable time of message delivery;
- systematize, archive and document necessary information on TCS functioning;
- exchange information with other elements of complex system of security of the NF.

11.6.4 TCS should have backup and alternative channels for transmission of information functionally important for the efficiency of the complex (circuit caching, use of routers, etc.). Backup channels should be routed over routes physically spaced with other main channels.

11.6.5 TCS should provide formation of a closed information transmission system, providing the operational capability of individual protected areas (area). One or a few well-protected communication channels inaccessible to offenders should be used to interact with other elements of PPETF complex.

11.7 Power supply and lighting subsystem

11.7.1 The power supply subsystem is designed to provide uninterruptible power supply of elements to PPETF complex.

11.7.2 The power supply of main PPETF elements should come from two independent power sources backing up each other. Transition to backup power should be automatic.

11.7.3 Information on transition of PPETF or its elements to back-up power should be displayed on the relevant LCU and CCU with compulsory recording.

11.7.4 Power supply devices and cable networks should be protected against UA.

11.7.5

11.8 Subsystem of information security

11.8.1 The need to protect information in the PPS NF is due to the presence of information containing state and official secrets, information disclosing the PPS at a particular NF, and (or) determining the mode of its operation in this system. Such information is sensitive in relation to unauthorized influences and efficiency of operation of the PPS or its separate elements can be reduced as a result of such impact.

11.8.2 The feature of modern PPS is that these systems are projected and realized taking into account using a computer and microprocessor technics, in this connection the PPS can be considered as the automated management information system of various level of integration intended for collection, processing, storage, display and information transfer about a condition of physical protection of various protected zones of NF.

11.8.3 The information security subsystem is a necessary component of an automated PPS. At all levels of control and phases of operation of the PPS (transmission, collection, processing, analysis, storage, transfer of control commands), information should be protected by using a set of devices and implementation of measures aimed at preventing leakage of information or at preventing impact on it through technical channels, at prevention of accidental or intentional software and hardware impacts with the purpose of breaching the integrity (destruction, distortion) of information during its processing, transmission and storage, or disruption of the operational capability of technical equipment.

11.8.4 The purposes, objectives and objects of information security in PPS as well as requirements for the information security are determined by the local normative legal acts of NF.

11.9 Requirements for placement and technical equipment of the operators posts of central and local control units by engineering and technical means of physical protection.

11.9.1 LCU and CCU are designed to display prompt and background information on the status of all elements of the PPETF NF complex or its stand-alone systems and on input of control commands, as well as documentation of circulating messages and actions performed by operator.

11.9.2 The information provided at the LCU should be duplicated on the CCU.

11.9.3 The necessary and sufficient information enabling the operator on duty to clearly assess the situation and make the right decision, as well as efficiently manage the processes occurring in the PPS (for LCU PPETF - for the part related to them) should be received and displayed at the control station.

11.9.4 Control stations should provide:

- protection of equipment and information in accordance with the requirements of information security regulations;
- documentation of all the operator's actions (including shift transmission and handover);
- testing of equipment without disrupting the PPETF complex or its individual elements;
- control of operator's activity
- duplication and backing up of equipment.

11.9.5 Control stations should be placed in LAZ that located in the corresponding protected zones in rooms, which are specially adapted for this purpose and have ballistic-resistant doors and windows and the relevant organization of access control.

CCU may be placed in LAZ that located both in internal and particularly important area; location depend on a place of their most effective operation. CCU operation should be provided in any situation according to design threat.

11.9.6 Administration of NF vests with authority operator of CCU PPETF must be a staff member of the SS with appropriate powers to perform tasks in conditions of normal and emergency situations.

The trained military personnel of IT MIA can be appointed as the operator of control centers of PPETF which protection is carried out by IT MIA.

11.9.7 It is forbidden to impose any functions which are not connected with implementation of main responsibilities to operators of control centers of PPETF.

11.9.8 The operators on duty at the CCU and at the relevant LCU should be informed of the features of technological process at NI and in SF NM that subject to the physical protection, in the scope necessary to perform their duties

11.10 Requirements for engineering means of physical protection

11.10.1 The fences of NF are designed to prevent passage of people and vehicles to and from facility bypassing the checkpoints and also for the limitation or exclusion of the ability to monitor production area from outside the protected area. Fences are constructed along the perimeter of protected areas.

The main fence runs along the perimeter of the protected area. The inner and outer fences of the prohibited zone pass through its borders.

11.10.2 Fences should meet the following requirements:

- the height and buriedness in the soil, satisfying the performance conditions of the facility and make it difficult to overcome
- simplicity of design, high strength and durability
- the design must have no elements that make it easier to overcome barriers;
- straightness and the minimum number of bends
- optimality of construction and operation from the point of view of criterion "efficiency-cost".

11.10.3 Artificial obstacles are devices and constructions arranged in a protected area, on approach avenues to buildings, structures protected of NI, SF NM in order to hinder the movement of offenders and create favorable conditions for their prompt detention by security guard units within the prohibited zone or on approach avenues to buildings and structures.

11.10.4 Artificial obstacles can be permanent and portable, and used for hindering (slowing down) intrusion (movement) of people or vehicles.

11.10.5 The design of artificial obstacles should meet the following requirements:

- hinder the movement of offenders deeper into a NF for a time sufficient for his prompt detention by security guard units;
- to limit the use of working tools by offender;
- to be repairable;
- not interfere with normal operation of detection devices;
- provide condition for the inspection of transport and for the safe conduct of duties by the personnel of the security guard units

11.10.6 The adequacy of artificial obstacles on the perimeters of protected areas should be supported by calculations in evaluating the effectiveness and by the results of exercises. Time when an offender can overcome the protected zone on this site of perimeter always has to be more than arrival time of guard forces for its neutralization.

11.10.7 For the movement of security guard units on vehicles, roads within the territory of a NF, as well as special roads (security guard roads) that can be built in a prohibited zone or outside depending on the width of the prohibited zone should be used.

Security guard roads should run outside the operation range of detection devices and have a minimum number of intersections with roads and railways existing at NF. They should be equipped with signs as stipulated by road traffic regulations. Their width and installation frequency should be determined by local conditions.

11.10.8 Warning signs with the inscription: "Passage (entry) is prohibited (closed)" should be installed along the obstacle line in order to warn about prohibition of passage to prohibited zone. In separate cases, there should be a warning sign with the inscription: "Passage is prohibited for unauthorized persons".

Warning signs should be placed on the inner and outer fences of the prohibited zone, using fencing poles or separate columns. Warning signs should be installed on bends (corners) of a prohibited zone, in wickets and gates to prohibited zones.

12 Requirements to protected areas

12.1 Protected areas and limited access zone

12.1.1 PPS NF should be built on zonal basis providing the organization of several boundaries of physical protection located consistently on the way of offender advancement to the purpose and providing the echelon protection.

12.1.2 The organization and creation of protected zones have to consider places of use and storage of NM in the territory of NF, placements of NI and other PPSt and to conform to

requirements to PPSt placement in the protected zones established in the section 8 of the present technical code.

12.1.3 The boundaries (perimeters) of protected areas should be equipped with PPETF according to the requirements 12.2 of the present technical code.

12.1.4 For the organization of passage of people and vehicles, checkpoints should be installed along the perimeter of the protected area. The optimal numbers of checkpoints for each protected area is determined by the conditions and peculiarities of their functioning.

It is necessary to divide the external and internal checkpoint as a part of PPS.

12.1.5 External checkpoints are located on the border of protected area and, as a rule, should provide high capacity at the established requirements to access control. Internal checkpoints are located on internal borders, particularly important and other areas of NF and have, as a rule, smaller capacity. Higher requirements for the organization of control function of entry (passage) legality are placed on them.

12.2 General requirements to equipment of protected areas

12.2.1 This section is provided general requirements to equipment of protected areas by engineering and technical means. Based on this technical code the standard design decisions that consider specific requirements to equipment of the protected areas of NF of various types and categories are developed. Requirements to equipment of the protected areas of specific NF can be specified on the basis of an assessment of PPS efficiency which is carried out at a predesign stage of creation or improvement of PPS.

12.2.2 Protected area

12.2.2.1 Borders (perimeters) of PA should be equipped. The prohibited zone is a specially equipped strip of the locality which should be equipped with:

- physical barriers that include the main fencing of the facility, external and internal fencings of prohibited area, engineering fencings. The total number of physical barriers should be kept more then two;

- at least two types of technical detection device working on different physical principles. Detection devices should be placed in such a way that their zones of detection were blocked and there are no uncontrolled areas ("dead zones");

- the opto-electronic surveillance devices
- means of wire line telephone and WD;
- lightening of the trace control strip;
- road of guard (trail outfits);
- protective and defense constructions;
- watch sheds, watch posts, observation towers;
- warning, demarcation and indicating signs;
- hiding places for the personnel of guard;
- drainage constructions (drainage pipes, flume, ditches, cuvette);
- engineering constructions and constructions of posts of tracker dogs.

Additional requirements to equipment of prohibited zone and its elements are established in the relevant TNLA.

12.2.2.2 Entrances (roads, terrains) to perimeter and (or) the checkpoint of PA through which intrude by the vehicles can be made, should be equipped with anti-ram devices, structures, ditches, anti-ram walls, specific blocks, etc., and a road bed should eliminate the possibility of development of speeds needed for a breakthrough (should have pillars, sharp turns, etc.).

12.2.2.3 The area adjoining the boundary of the PA should be cleared of shrubs, trees thinned in such a way as to prevent them from being used to enter the perimeter.

All parts of the perimeter should be placed in such a way to be monitored by the PPS personnel. In case of absence or impossibility of the EOSS installation the appropriate countervailing measures should be taken (observation posts are established). At the same time, duty guards should be equipped with technical means of supervision, means of a telephone or radio communication, WD and devices of activity control.

12.2.2.4 The control of passage of people to the checkpoints should be implemented with the use of full-height throughput devices of the lock or blocking type, providing reliable detention of persons who do not have right of access or who try to carry out the forbidden items.

In automated systems of access control in addition to control of passing, the ways of the identity card on the appropriated signs should be used.

12.2.2.5 Vehicle checkpoints should be equipped with entry and exit gates, inspection pits, racks, inspection mirrors, or other technical devices that provide a vehicle inspection from all sides.

12.2.2.6 Checkpoints should be equipped with detection devices of persons who provide implementation of check functions and protect from attack by small weapon.

12.2.2.7 The operation personnel of the checkpoint should have the technical means (stationary or portable) providing a possibility of inspection of NF personnel, the seconded officials and visitors on the subject of bringing of NM, ES, items made from metal. These persons and their personal items may be inspected.

12.2.2.8 All vehicles leaving the protected zone as well as the carrying containers (packings) should be inspected in the obligatory way with implementation of the two-person rule for identification of unauthorized carrying of NM.

12.2.2.9 The situation at the checkpoint should be controlled by means of EOSS, and means of telecommunication as well as WD should be placed at the checkpoints. The cabins that protect the persons who are carrying out check functions, from defeat by small arms have to be equipped with means of direct telecommunication and EOSS.

12.2.2.10 All emergency exits located in this protected zone as well as emergency exits from buildings and constructions where NM and (or) NI are located, should be locked, equipped with alarm system and provide unhindered exit of people during emergency situation.

12.2.3 Interior area

12.2.3.1 Requirements to equipment of interior area by technical means are similar to the requirements 12.2.2.2-12.2.2.10 of the present technical code.

The following requirements should be implemented additionally.

12.2.3.2 Alarm system and EOSS should be established along the border of interior area, and if the perimeter do not coincide with the building perimeter (construction, room), it should be equipped with fences and artificial obstacles.

12.2.3.3 Perimeters of buildings and constructions located in this protected zone should be equipped with alarm system and EOSS, and entrances, in case of need, are strengthened in the engineering relation, providing strength balance with other elements of building constructions. This requirement should be implemented taking into account the requirement 12.2.3.2 of the present technical code.

12.2.3.4 The checkpoints should be equipped with stationary means, and the personnel which implements check functions - manual items of a bringing (transportation) of NM, ES and items made from metal.

If there is no NM, items made on their basis and (or) NI in this protected area, it is allowed not to establish means of detection at the checkpoint.

12.2.3.5 Personnel of NF, seconded officials and visitors, their private things should be inspected at the checkpoints in order to prevent carrying of forbidden items (NM, ES, items made from metal).

12.2.3.6 In addition to requirements 12.2.2.4, control access of passing persons can be exercised either with application of the appropriated individual characteristics, or biometric parameters of the person.

12.2.3.7 Control of the leaving vehicles and carrying containers (packings) should be implemented with application of two-person rule.

12.2.3.8 All entrances (exits) to buildings, structures and rooms, located in this protected area should be equipped with alarm system, EOSS and items providing control access.

12.2.4 Particularly important area

12.2.4.1 Requirements to equipment by technical means of particularly important area are similar to the requirements 12.2.3.1-12.2.3.8 of the present technical code.

12.2.4.2 All operations made in particularly important area should be carried out applying the two-person rule (access to/from the area, access to certain rooms, constructions, buildings, disarming (arming), etc.).

12.2.4.3 For the control access of passing persons it is necessary to use the biometric methods of ID applied with the appropriated individual characteristics. This requirement is obligatory during performance of work with PPSt of A or B category as well as during implementation of access to the rooms of A or B category.

12.2.4.4 All persons and their things must to be inspected on presence of NM at the exit from the particularly important area.

12.2.5 Limited access area

12.2.5.1 Limited access area should be equipped with engineering and technical means according to importance of the elements placed in them, devices, equipment, etc. Requirements to equipment of the limited access area should be regulated by local normative legal acts, including on the privacy mode, information protection and may be specified at a stage of carrying out the vulnerability analysis of facility.

12.2.5.2 Requirements on equipment by engineering and technical means of physical protection of control centers of PPS and other vital objects of informatization of PPS are established in local normative legal acts of NF.

13 Procedure for creation and improvement of a physical protection system

13.1 Stages of creation and improvement of a physical protection system

13.1.1 Procedure for creation and improvement of PPS includes the following stages:

- pre-design stage;
- design stage;
- commissioning stage of PPS.

13.1.2 Stages and specific work on creation and improvement of PPS implemented by the organization-participants should be established in the agreements and technical specifications (in individual technical specifications). Requirements to the organization participating in creation and improvement of PPS are provided in section 13.6 of the present technical code.

13.1.3 Requirements for creation of a subsystem of information protection in PPS are established by local normative legal acts of OO.

13.2 Pre-design stage

13.2.1 Creation and improvement of a PPS should be based on the results of analysis of the vulnerability of the NF for ensuring adequacy of PPS to the threats defined for NF.

13.2.2 In creating and improving the PPS, the category of NF defined on the basis of results of the vulnerability analysis should be taken into account.

13.2.3 The categorization of NF which is carried out according to requirements of the section 8 of the present technical code includes the following:

- categorization of PPSt;
- reference of PPSt to the corresponding protected zone;
- categorization of rooms (buildings, constructions – if necessary), carried out to differentiate the requirements to organizational and technical measures of physical protection.

13.2.4 At the conceptual design stage of PPS, the materials of vulnerability analysis and categorization of NF should be used as input data. The purpose of carrying out conceptual design is achievement of maximum effectiveness of PPS on the basis of the restrictions for financial and other resources set by the customer and taking into account requirements of normative legal acts and TNLA to PPS.

13.2.5 Development of the PPS conceptual project includes the following:

- analyze of threats and models of offenders;
- allocation on NF of the protected zones;
- specification of PPS configuration in general and its separate component;
- specification of functional and technological communications both inside of PPS, and with other security systems of NF;
- formation of various options of the PPS creation;

- effectiveness assessment of options of PPS creation;
- estimation of cost of options of PPS creation;
- the choice of option (options) on the basis of criterion "efficiency cost";
- preparation of proposals for inclusion in the terms of reference on creation (modernization) of PPS.

13.2.6 The procedure and methodology of carrying out conceptual design are determined by the OO.

13.2.7 The technical specifications for the creation (improvement) of a PPS should be developed in order to form and detail the requirements of the customer for the PPS based on the conceptual design results, as well as to determine the composition, content and procedure of work on the commissioning of the PPS.

Its composition and contents, as well as order of coordination and approval are determined according to local normative legal acts of OO on development of TS on creation (improvement) of PPS

13.2.8 The technical (private technical) specifications on the components of PPS are developed if it is necessary.

13.2.9 The technical specification on design is developed for carrying out project works on creation (improvement) of PPS.

Its composition and contents, as well as order of coordination and approval are determined according to local normative legal acts of OO

13.2.10 Justifications of investments is developed according to the requirements of CHB 1.02.03-97

13.3 Design stage

13.3.1 Design activities on the creation and improvements of a PPS are implemented during the new construction of NF, its reconstruction or technical re-equipment, its removal from operation, while reconstruction or technical re-equipment of a PPS is carried out on existing NF.

During construction of new NF (its reconstruction or technical re-equipment), a design project documentation for the PPS should be developed in form of a separate section in the project documentation for facility construction at the following stages: an investment feasibility, feasibility study (project) of construction. The working documentation for the PPS based on the approved feasibility study (draft) in accordance with established procedure.

During reconstruction and technical re-equipment of a PPS only, a feasibility study (draft) on the PPS, or a working project (approved part and working documentation), or working documentation should be developed.

13.3.2 Development of the project documentation for the PPS should be implemented in accordance with requirements of STB 1.03.02-96 on the basis of the approved justifications of investments into construction.

The order of development, coordination, approval and structure of project documentation on PPS, an order of carrying out expertise of the section of the PPS project (PPS project), and also design supervision and the organization of construction at a construction of PPS are carried out according to provisions TCP XXX-20xx "Physical protection system of nuclear materials and installations. Instruction on the organization of design".

13.3.3 Design, technical and organizational solutions on the PPS of specific NF should be developed based on TNLA as well as with the use of standard design solutions and main provisions and requirements of TCP XXX-20xx "Physical protection system of nuclear materials and installations. Instruction on the organization of design". The present technical code establishes requirements for the project decisions on equipping by engineering and technical means of physical protection.

Design, technical and organizational solutions on the PPS of specific NF are developed on the basis of TNLA, and also when standard design decisions and basic provisions and requirements of TCP XXX-20xx "Physical protection system of nuclear materials and installations. Instruction on the organization of design" are used.

The present technical code establishes requirements to design decisions on equipment by engineering and technical means of physical protection, the choice and placement of the equipment in relation to the corresponding parts and sections of the project and serves as methodical material in the preparation of terms of reference on design as well as developments of the PPS project.

13.4 Commissioning stage of PPS

13.4.1 Commissioning stage of PPS includes the following stages:

- the preparation of NF for input of PPS in action;
- the preparation of PPS personnel;
- equipping a PPS with a set of PPETF;
- construction and installation works of PPETF complex;
- commissioning works of the PPETF complex;
- carrying out preliminary tests of the PPETF complex and (or) its components;
- carrying out the trial operation of PPS;
- carrying out acceptance tests of the PPETF complex;
- the acceptance of the PPS by the acceptance committee.

13.4.2 Preparation of NF for input of PPS in action includes work on organizational preparation for input of PPS in action, including:

- formation and specification of system and ways of protection of NF;
- formation and specification of organizational and regular structure of security service and guard units of NF;
- selection and check of personnel of PPS;
- development of drafts of local normative legal acts of NF on physical protection, duty and office regulations of the PPS personnel and their statement.

13.4.3 Preparation of PPS personnel includes:

- carrying out training of personnel of PPS;
- inform the PPS personnel about the requirements of local normative legal acts of NF on physical protection, duty and office regulations, that concerning them;
- check the ability of personnel to provide functioning of PPS.

13.4.4 Equipment of PPS by TMPP includes:

- providing receiving of components, materials and assembly products;
- carrying out quality control of components, materials and assembly products.

13.4.5 Construction and installation work includes:

- the implementation of work on construction of specialized buildings (rooms) for placement of technical means and PPS personnel;
- the construction and equipment of engineering means of physical protection;
- the construction of cable channels;
- the performance of work on installation of technical means and communication lines;
- the test of the mounted technical means and communication lines;
- the construction and equipment of control centers;
- the delivery of technical means for carrying out commissioning works.

13.4.6 Commissioning work includes:

- the autonomous adjustment of technical and software means;
- the complex adjustment of all technical means of the TMPP complex

13.4.7 Carrying out preliminary tests includes:

- the test of the TMPP complex for working capacity and compliance to the technical specification according to the program and a technique of preliminary tests;
- the elimination of faults and modification of documentation on the TMPP complex and PPS, including operational according to the test report;
- drawing up of the act of acceptance of the TMPP complex in trial operation.

13.4.8 Carrying out trial operation includes:

- the trial operation of TMPP;
- the analysis of results of trial operation of the TMPP complex;
- additional adjustment (if necessary) of TMPP;
- software revision (if necessary) of the TMPP complex;
- drawing up of the act of the trial operation termination.

13.4.9 Carrying out acceptance tests includes:

- correspondence tests to the technical specification according to the program and a technique of acceptance tests;
- the analysis of tests results of the TMPP complex and elimination of problems revealed during the tests;
- drawing up of the act of acceptance of the TMPP complex in constant operation.

13.4.10 Acceptance of PPS by the interdepartmental commission includes:

- the analysis of the act of TMPP complex acceptance in constant operation and check of problems elimination revealed during trial operation and tests of the TMPP complex;
- determination of correspondence of parameters and characteristics of PPS to requirements of TNLA, design and project documents;
- check of the contractors for all necessary special permits (licenses) for the right of the activity which is subject to licensing according to [6];
- check of certificates of conformity on TMPP which are subject to obligatory certification according to TCP 5.1.01-2004;
- carrying out certification of PPS in compliance with information safety requirements;
- the analysis of results of acceptance of PPS and elimination of problems revealed during the tests;
- drawing up of the act of acceptance of the PPS by the interdepartmental commission.

13.4.11 Representatives of administration of OO, NF, government bodies on regulation of safe use of atomic energy have to be a part of the interdepartmental commission on acceptance of PPS. The procedure of formation and work of the commission is defined by the current normative legal acts. In the act of the interdepartmental commission the conclusion about correspondence of PPS to requirements of safe functioning of NF should be made.

Act of the interdepartmental commission is coordinated in accordance with the established procedure and approved by OO, the internal affairs bodies and (or) CDC VV MIA.

13.4.12 At new construction of NF stage-by-stage input of components and PPS elements in process of starting of construction and installation works on construction of object is carried out. Full-scale functioning of PPS should be provided by the time of the end of NF construction.

13.4.13 At improvement of PPS, stage-by-stage additional or the advanced PPS elements input may be also carried out depending on its volume and contents. Changes in structural and functional creation of PPS and in its structure should be followed by specification of organizational actions in PPS, including development (adjustment) of local normative legal acts of NF on physical protection and duty regulations of the PPS personnel.

13.4.14 Input of PPS (PPS separate elements) in action should be carried out according to the program coordinated by the customer and the contractor in which requirements to sequence and volume of PPS (PPS separate elements) input in action, and also an order of acceptance of PPS (PPS separate elements) according to requirements of TS on creation (improvement) of PPS (PPS separate elements) and the operating TNPP have to be established. The administration (SS) of NF should provide coordination with the contractor and implementation of the program of PPS (PPS separate elements) input in action.

13.4.15 The commission appointed by the head of NF carries out stage-by-stage acceptance of separate components and PPS elements. The structure and an operating procedure of the commission is defined by the volume and content of a stage acceptance determined by the program of input of PPS in operation.

13.4.16 Input of PPETF in operation**13.4.16.1** Input of PPETF in operation includes:

- selection of the personnel for PPETF technical service;
- training and access of personnel to PPETF operation;
- acceptance of PPETF after termination of construction and installation works and commissioning works;
- reserved of PPETF, instruments and equipment for divisions and responsible persons.

13.4.16.2 Acceptance of PPETF into service from administration of NF by guard units is carried out by acceptance commissions according to the requirements of TNLA on equipment of PPETF facilities and TCP 45-1.03-59.

13.4.16.3 PPETF accepted in operation by an order or act and is assigned to divisions and responsible persons on receipt, and the corresponding register is made in the form with the indication of date and number of the order (act). From the moment of the publication of the order (the adoption of the act) PPETF are considered to be put into operation.

13.4.16.4 Persons who start to gain PPETF after its acceptance into operation should examine condition of PPETF, completion of equipment and equipment integrity and bear full responsibility for their technical condition and safety from that moment.

13.4.16.5 The entire period of input of PPETF in operation is used for training of personnel which should operate this devices and the equipment, passing tests on knowledge of duties, rules of operation, rules and measures of safety regulations.

13.4.16.6 During carrying out improvements of separate components and elements of the present PPS it is allowed not to carry out acceptance of PPS in general. The commission appointed by the head of NF should carry out acceptance of the newly created and advanced PPS elements, as well as other components and elements of PPS, directly connected with them. The results of the commission work on commissioning of advanced PPS are presented to the OO.

13.5 Evaluation of the effectiveness of a physical protection system

13.5.1 The quality of creation and operation of a PPS should be confirmed by the evaluation of its effectiveness. Evaluation of the effectiveness of a PPS represents an evaluation of ability of the PPS to resist to actions of offenders taking into account the threats defined in the process of the vulnerability analysis and models of offenders.

13.5.2 The effectiveness of a PPS should be evaluated experimentally (in exercises), analytically or by modeling at various stages and phases of creation of the PPS, as well as during its operation. The evaluation of the effectiveness of a PPS should be used to identify ways of improving the PPS.

13.5.3 The methodology of an analytical evaluation of PPS effectiveness is defined by a local normative legal act of the OO.

The software tools allowed for use in accordance with the established procedure can be used in the course of carrying out an evaluation of effectiveness.

13.6 Requirements for organizations involved in the creation and improvement of physical protection system

13.6.1 In the creation and improvement of PPS, organizations that have special permission (license) for the specified kinds of activity given by authorized government bodies may carry out design, construction and installation works and commissioning works.

13.6.2 The specialized design organization (the general design organization) providing complex development of the project and its maintenance should carry out the design. The design organization can attract the subcontract organizations in coordination with the customer, which received special permission (license) in accordance with the established procedure for the corresponding kind of activity.

The enterprises that have special permission (license) of authorized government bodies to implementation of works with use of information making the state secrets are involved in development of separate sections of the PPS project according to [6].

13.6.3 According to the legislation, PPETF that delivered on NF should have the certificate of conformity and enter the list of the equipment allowed for the use as a part of the PPETF complex and approved by OO.

14 Requirements for planning and organization of operation of physical protection system

14.1 General requirements for planning and organization of operation of physical protection system

14.1.1 Creation, improvement and operation of PPS NF should be carried out on the basis

of uniform system of planning and coordination of activities for realization of a complex of organizational and technical measures of physical protection at a NF.

The main objectives of planning and organization of PPS operation are the following:

- providing an established order and terms of creation and improvement of PPS;
- providing the uninterrupted and coordinated operation of all structural components and elements of PPS;
- coordinating of efforts of NF administration, its security service and personnel, guard units and territorial authorities of internal affairs on NF safety.

14.1.4 Works on creation, improvement and operation ensuring of PPS are the part of plan of work on safety of NF, as well as part of plans of works of the relevant structural divisions of NF, the internal affairs bodies and (or) CDC VV MIA (in coordination with them).

14.1.5 Plans of works for physical protection should be formed taking into account the following results:

- vulnerability analysis of NF
- categorization of PPS and NF;
- estimates of effectiveness of SFZ;
- works on finding of further ways of improvement of the PPETF complex;
- estimate of current status and service life of PPETF;
- operating experience of the PPETF complex;
- corrections of models of offenders and threats;
- changes of ways of protection and tactics of actions of response forces;
- conducting exercises of inspection and testing of interaction in PPS;
- state supervision, departmental and administrative control.

14.1.6 Plans of works on physical protection should provide:

- stage-by-stage implementation of measures for creation and improvement of PPS;
- development and correction of local normative legal acts of NF listed in 10.2.4 of the presents technical code;
- implementation of measures for maintenance of PPS according to the requirements of legislative and local normative legal acts of OO;
- carrying out technical re-equipment of the PPETF complex;
- training the personnel and increase of their qualification;
- implementation of organizational actions;
- a set of measures for improvement of structures of PPS management;
- control of providing requirements of legislative and local regulations normative legal acts of OO and NF, as well as plans of works.

Plans of works on physical protection may be both annual, and perspective.

14.1.7 The planned works demanding capital investments should be confirmed by design and budget documentation.

14.1.8 In plans for each type of works have to be specified the following information:

- eligibilities for integration of this work into the plan;
- sources and amounts of financing;
- terms of carrying out and responsible persons;
- results and (or) reporting materials on the implemented works.

14.1.9 Plans of works on creation, improvement and ensuring operation of PPS should be approved by the head of NF and should send on request to OO.

14.1.10 Due to the specificity of work on planning and organization of operation of PPS NF it should be implemented confidentially, and documents with its results should be protected from the persons which don't connected with it. The head of SS (the deputy head of NF on safety) should provide the control of work confidentiality and privacy of its results.

14.1.11 Providing the uninterrupted and coordinated operation of all structural components and elements of PPS is achieved by the following actions:

- uninterrupted and effective coordination through the efforts and means of PPS;
- development and introduction of the local normative legal acts provided in 10.2.4 of the

present technical code in accordance with the established procedure;

- training of the SS personnel, guard units and other divisions of NF for actions in the conditions of normal and emergency situations;
- maintenance of TMPP in operating condition;
- regular and qualified control of requirements of the documents regulating questions of ensuring physical safety of NF;
- constant tracking of the changing operational situation, identification of the circumstances that worsen the security of NF and appropriate response to it;
- timely adoption of effective measures on elimination of the problems revealed in the system of physical protection.

14.1.12 Interaction of the administration of NF, security service and personnel, guard units and territorial authorities of internal affairs on ensuring physical safety of nuclear facility is achieved by the following actions:

- awareness, accurate and timely implementation of the plan requirements on protection and defense of NF by all SS divisions and guard units;
- implementation of plans of interaction of administration, SS, guard units, NF personnel and territorial authorities of internal affairs in normal and emergency situations;
- timely response to changes of a situation around and directly at NF, as well as introduction of appropriate amendments to the developed plans.

14.1.13 Planning of works on creation, modernization and ensuring operation of PPS NF is carried out on the basis of the analytical work on safety issues of its functioning and effective use of its results, including:

- carrying out the timely and full vulnerability analysis of NF;
- CUA assessment at realization of the threats defined during implementation of the vulnerability analysis;
- use of results of work on the vulnerability analysis of NF and on categorization of PPSt during effectiveness evaluation of PPS which is carried out both independently, and with involvement of the specialized organizations;
- results of analytical work in the creation, improvement and operation of PPS.

14.2 Requirements to allowing system access of performers to work with nuclear material and nuclear facility

14.2.1 The main objective of an allowing system access at NF is creation of the conditions excluding a possibility of receiving of permission to the right of work with NM and other PPSt, as well as at NF by the facility personnel and staff of guard units as well as seconded officials and visitors without the production need.

14.2.2 Work on the organization of the admission at NF is the procedure of check of the personnel providing receiving the reliable information confirming professional suitability and absence of medical contraindications concerning the checked person, as well as special inspection that is carried out according to [3] and [7].

This work has to be implemented according to the local normative legal act on an allowing system access to NM, NF and SS NM, to information on PPS operation that is approved by the head of NF in coordination with territorial authorities of state security.

14.2.3 The order established by the local normative legal act of NF is obligatory for all NF personnel and staff of guard units, as well as for seconded officials and visitors

14.2.4 The head of security of NF bears responsibility for the implementation of established requirements.

14.3 Requirements for organization and operation of access mode and intrabuilding regime

14.3.1 Access mode, i.e. established order of the admission of the personnel, visitors, seconded officials, vehicles, items, materials and documents through borders of the protected zones, in (from) the building, construction, room of nuclear facility, should exclude:

- unauthorized access of the NF personnel and guard units, seconded officials and visitors as well as unknown persons in the protected zones, buildings, constructions and rooms;

- bringing (import) in the protected zones, buildings, constructions and rooms of the prohibited items;
- unauthorized carrying (export) from the protected zones, buildings, constructions and rooms of items, materials and documents;
- theft of nuclear materials and products made on their basis.

14.3.2 Access mode is provided with creation and implementation of operation of a control system and management access and continuous protection of perimeters of the protected zones, buildings, constructions and rooms.

14.3.3 Requirements to the AMCS organization and its operation are regulated by the Instruction on access mode and other documentation developed at NF, and that determines the following:

- the characteristic of the set access mode;
- an admission order in the territory of the protected zones, LAZ and in categorized rooms of NF personnel and guard of units, seconded officials and visitors through the checkpoint;
- an admission order in the facility territory of vehicles, export (import) of NM and products made on their basis, other materials;
- types and groups of admissions, the procedure of their registration and issuance, codes which are write down in admissions;
- accounting and reporting, order of storage of admissions, seals and codes;
- the description of admissions and the list of the codes existing at NF;
- obligations of administration, SS and guard units, heads of structural divisions of NF in terms of ensuring the access mode;
- obligations of SS officials and guard units for implementation of access mode, as well as an course of actions in normal and emergency situations.

14.3.4 According to [1] the NF personnel and staff of guard units, seconded officials and visitors, as well as their things and vehicles can be examined in the protected territories and the checkpoint by representatives of SS and guard units, including with application of special means.

Special means are considered to be devices, instruments, analyzers and service animals by means of whom detection of the prohibited items is possible (weapons and explosive substances, highly flammable liquids, incendiary materials and mixes, poisonous and toxic materials, psychotropic drugs and drugs, alcohol, etc.), as well as timely detection of attempts of theft and illegal movement of NM and products made on their basis.

14.3.5 Requirements for the organization of intrabuilding regime are regulated by the local normative legal act developed at NF and which define:

- performance of an internal labor daily regulations by the NF personnel and staff of guard units, as well as seconded officials and visitors;
- protection of the NF territories, buildings, structures and rooms in which NM and items made on their basis are used, stored or moved;
- masking the locations of NM and items made on their basis;
- carrying out explanatory work with the personnel that working directly with NM and items made on their basis, about responsibility for their safety and integrity;
- providing an established order of use of documentation containing information about NM and items made on their basis, systems of safety ensuring, including PPS, as well as places of use, storage, processing of NM and items made on their basis, terms and routes of their movement;
- implementation of fire safety regulations;
- control of requirements implementation of the intrabuilding regime.

14.4 Admission of performers to the work with nuclear materials and at nuclear facilities

Authorization access system of performers to the work with NM and at NF, as well as access mode and intrabuilding regime should be constructed and operated on the principles of interaction and mutual addition with system of the account and control of NM and other security systems of NF.

14.5 Requirements for the organization of protection

Divisions of the internal affairs body and (or) internal troops implements the protection of NF.

The list of NF protected by internal troops of the MIA of the Republic of Belarus is defined by acts of the President of the Republic of Belarus.

The order of service of guard forces and tasks which carried out by them are defined by the normative legal acts in compliance with [8] and [9].

15 Requirements for maintenance of engineering and technical means of physical protection

15.1 General requirements

15.1.1 PPETF maintenance include technical operation and use of PPETF in the order established by the corresponding operational documentation.

PPETF technical maintenance is a set of organizational and technical measures aimed at preserving and maintaining it in good condition, providing the constant readiness of PPETF for use, and restoring their operational capability and resource.

Technical maintenance of PPETF should include:

- entry into service (it is carried out according to 13.4.16);
- professional selection, training and access authorization of PPS personnel to PPETF operation;
- planning of technical maintenance;
- functional inspection and repair;
- logistics and metrological support;
- keeping of maintenance documentation and records;
- record, storage, transportation and conservation;
- collection, recording and analysis of operational data on the reliability and stability of PPETF operation;
- monitoring and assessment of technical condition and maintenance organization;
- organization of works on promotion and compliance with rules and safety measures during operation
- reclamation work;
- write-off of TMPP.

15.1.2 Heads and commanders of all levels are responsible for the proper organization and high-quality carrying out of technical maintenance of PPETF.

According to their responsibilities, heads and commanders of divisions, engineering and technical staff and persons responsible for PPETF bear direct responsibility for PPETF technical condition, timely and high-quality performance of routine maintenance and repair works.

15.1.3 Functional inspection, current and average repair of PPETF is carried out at the expense of the funds allocated by protected NF.

15.1.4 The relevant divisions of the protected NF carry out full repair of PPETF, as well as functional inspection of power lines of power supply, mechanisms of drives of gate and barriers, means of security lighting, connecting communication lines and the alarm system which pass on the NF cable networks.

15.2 Professional selection, training and access authorization of personnel to operation of engineering and technical means of physical protection

15.2.1 The following personnel should be allowed to operate PPETF:

- a personnel who has undergone special training and probation and who has practical experience in PPETF operation as part of his functional responsibilities;
- a personnel who has undergone a test by the qualifying commission appointed by order of the head of NF on knowledge of the material part of PPETF, rules of their operation, rules and safety measures, and who has the appropriate qualification safety group;
- a personnel who has received a license to operate PPETF NF.
- a personnel who has the relevant admission.

Access authorization of personnel who does not meet the above requirements to operate PPETF is strictly prohibited.

15.2.2 Selection of PPETF experts should be conducted in accordance with their medical contraindications, educational level, skills, work experience with the device, desire for study and learning of PPETF.

15.2.3 A frequency of testing the knowledge of the rules of operation and safety among the personnel who directly work with PPETF, should be established once to half a year according to [10-11]. Other PPETF experts should be established annually or with the frequency established by SS NF.

15.3 Planning of technical maintenance of engineering and technical means of physical protection

15.3.1 Planning of technical maintenance of PPETF on NF is implemented by the heads (commanders) of the divisions which are carrying out its operation in interaction with administration and SS NF.

15.3.2 Plans should reflect measures:

- on technical maintenance;
- on organization of repair and storage;
- on logistics support of operation;
- on organization of collection, recording and analysis of data on the noise immunity and serviceability of PPTF;
- on safety regulations;
- on monitoring over the technical condition and organization of PPETF operation

15.3.3 The main documents on planning of construction and operation of PPETF on NF are:

- construction plans (reconstruction) and repair of PPETF facility for a year and for further extension;
- the plan schedule of performance of routine maintenance works for functional inspection of PPETF facility for a year;
- the plan of measures on transfer of PPETF to spring-summer and autumn-winter operation;
- plan-application for logistic supply of PPETF complex on next year.

15.3.4 The construction (reconstruction) plan and repair of PPETF facility is developed for a year and for further extension and include amount of works on construction of new PPETF, also reconstruction and repair of existing on facility PPETF, cost and terms of work performance, as well as executives. The plan is developed by division of PPETF NF, and for the facilities protected by divisions of internal troops, a staff of military unit together with SS NF. The plan is approved by the head of NF and the commander of military unit.

15.3.5 The plan schedule of performance of routine maintenance works for functional inspection of PPETF facility is developed for a year by PPETF NF division, and for the facilities protected by divisions of internal troops, the deputy chief on PPETF part (division) together with security service of NF and is approved by the deputy head of SS NF and the chief of a staff part (division).

Planning of routine maintenance works is made separately for each type (groups of samples of each type) of technical means of physical protection

15.3.6 The plan-application for logistic supply for a year is formed in terms and in the form established by NF.

15.4 Functional inspection and repair of engineering and technical means of physical protection

15.4.1 Functional inspection and repair of PPETF should be a set of organizational and technical measures aimed at maintaining PPETF in a good condition.

15.4.2 Maintenance of PPETF should include:

- routine maintenance work;
- unscheduled maintenance;
- maintenance in storage;
- monitoring of measuring instruments

Routine maintenance work should be the basis for maintenance of PPETF.

15.4.3 The main tasks of PPETF maintenance should be:

- malfunction identification and repair of NF equipment by engineering and technical means

of physical protection;

- definition of a qualitative condition of PPETF and check of their working capacity;
- providing an optimum operating mode of PPETF and extension of reserve maintenance periods of operation
- mitigation of the effects of adverse climatic conditions and other conditions on PPETF ;
- instrumental checking of equipment, line-cable devices, and switchgears;
- malfunction identification and repair, PPETF failure prevention;
- malfunction identification and repair of requirements violations of rules and measures of safety technique during the work of personnel;
- preparation of PPETF for spring-summer operation;
- verification of the completeness of mechanisms, devices, and availability of instruments, reinforcement with spare instruments and accessories.

15.4.4 Maintenance of PPETF should be organized and conducted in a timely manner by the head of those divisions that are responsible for the relevant means.

15.4.5 Maintenance of PPETF should be carried out according to the schedule preventive system, providing the following routine maintenance intervals: daily, weekly, monthly, quarterly, semiannual and annual maintenance.

The maintenance procedure should be determined in accordance with the PPETF operational documents.

15.4.6 During performance of routine maintenance work they do the:

- detection and elimination of faults of the equipment of PPETF facilities;
- service of PPETF and sources of power supply;
- verification and bringing to the norms determined by operational documentation, the PPETF technical parameters;
- control of observance of technology of works and quality of functional inspection of PPETF;
- control of observance of rules and measures of safety techniques;
- verification and filling of operational documentation.

Direct performers bears responsibility for completeness and quality of performance of routine maintenance works.

15.4.7 Repair can be carried out according to plan and unscheduled depending on features of PPETF, character and extent of damages. At the same time, short recovery repair of PPETF is carried out on an installation site. In other cases, the removable equipment (blocks) is replaced by reserve equipment, and repair is carried out in workshops or at the manufacturer.

15.4.8 As a rule full, average and recovery repair of stationary constructions are made by forces and means of the protected NF on the basis of the annual construction plan and repair of PPETF facility.

Logistics and metrological support of PPETF operation should be carried out by FN administration by means of the relevant divisions of SS and logistic supply according to the order established at NF and requirements of TNLA.

Control of logistics support to PPETF operation should include:

- checking for the availability, quality state and completeness of PPETF in warehouses, in subunits, and in workshops;
- conformity of PPETF availability data to the basic record;
- checking the organization of PPETF record;
- development of measures aimed at eliminating identified deficiencies

15.4.9 The maintenance of PPETF operational documentation should be carried out at PPETF subunits. The basic maintenance documentation should be supplied with a manufacturer and a specific PPETF.

The maintenance documentation includes:

- technical specification;
- operation manual;
- instruction for installation, start-up and adjustment;
- form;
- passport;
- statement for completion SPTA.

15.4.10 Account, storage, transportation and conservation of PPETF should be carried out at NF according to requirements of operational documentation for a specific product.

PPETF records at NF is kept in logistical and financial divisions, as well as in warehouses in accordance by cards and books in the prescribed manner. PPETF that have become unusable should be written off from the records in the prescribed manner. The head of NF approve acts of the commissions on written off. PPETF records should reflect the correct and timely documentation of their actual existence.

PPETF storage means their short-term or long-term maintenance in designated locations in good condition. All PPETF under long-term storage (more than a year) should be conserved. Conservation should consist of conduct of work on temporary protection of PPETF, stored under adverse conditions, against harmful effects of external factors (mainly humidity and air pollution). Conservation should be conducted by methods of sealing, protective coating, or by a combined method.

15.4.11 Collection, recording and analysis of operational data on the reliability and noise immunity of PPETF should be conducted in accordance with local normative legal acts of NF.

15.4.12 Monitoring and assessment of technical condition and organization of PPETF operation should be conducted in accordance with the NF plan for inspection of the technical condition and operational capability of PPETF by persons directly involved in managing the PPS, as well as by departmental committees (DC) according to the provision on departmental control on ensuring physical protection for the purposes of inspections :

- PPETF application effectiveness;
- PPETF operational capability;
- compliance with operation procedures and rules;
- readiness of guards to perform tasks using PPETF

15.4.13 Organization of work on promotion and compliance with rules and safety measures during PPETF operation should be carried out in strict accordance with the requirements of governing documents, current TNLA as well as with the operational documentation.

15.4.14 Reclamation work is carried out by division of PPETF together with SS NF divisions.

The purpose of reclamation is restoration of quality of production (the performed works) in established periods, identification and elimination of the causes of defects, as well as increase of responsibility of suppliers for quality of the delivered production, contractors for quality of the performed works (installation, commissioning, etc.) and consumers for observance of service conditions, storages and transportations.

The reclamation act is made by the bilateral commission with participation of the NF representatives and the enterprise supplier on the form prepared by the corresponding TNLA. Special attention is paid on completeness of a statement of defect causes and objectivity of the conclusion made by the commission.

15.4.15 Write-off of PPETF which repair is impossible or impractical should be made if they have lost the functions due to runout, after established periods of operation or have been destroyed by natural disasters or accidents. The expiration of established periods of operation or shortage can not form the basis for write-off of PPETF if they on the technical condition are suitable for further use for the intended purpose.

Acts of write-off of PPETF are signed by members of specially appointed commission and are approved by the head of NF. The completed forms with signatures of the corresponding officials and an official stamp of NF are attached to acts.

16 Requirements for organization and providing of training on inspection and testing interaction within the physical protection system

16.1 The administration of NF regularly organizes and takes part in providing of joint training with guard units, the interacting internal affairs bodies and internal troops of the MIA and state security.

16.2 Purposes of the training may be the following:

- training;
- educational;
- research.

Training purposes include:

- training of heads and governing bodies of different levels the correct assessment of a situation, timely making a decision and statement of tasks on questions of physical protection;

- improvement of coherence of involved forces and means;
- training in collecting and analysis of data on a situation, calculations, preparation of documents, finishing tasks and the organization of comprehensive providing.

Educational purposes include education of the moral and psychological qualities necessary for actions of PPS personnel in difficult conditions.

Research purposes include:

- assessment of readiness level of PPS personnel and the PPETF complex to implementation of PPS tasks;
- assessment of the organization level of interaction between SS and NF guard units, as well as PPS personnel with territorial authorities of state security, the internal affairs bodies and internal troops of the MIA;
- working off of tactics of guard actions and the accompanying personnel at various scenarios of realization of offender actions;
- research of new tactical ways of action of PPS personnel in different situations of PPS functioning.

16.3 Trainings are subdivided on the scale, purpose, number of the trained parties and the place of their carrying out.

16.4 Joint trainings of security services, guard units and the interacting bodies are carried out at least once a year

16.5 Participants of the training may be:

- NF administration;
- internal troops of the MIA;
- territorial bodies of internal affairs
- state security agencies;
- governing bodies of the Armed Forces of the Republic of Belarus, territorial divisions of the MES of the Republic of Belarus, the State boundary committee of the Republic of Belarus;
- administrations of the railroads, bodies of special transportations on the railroads, bodies of military communications;
- administrations of the airports of civil aviation and the internal affairs bodies on air transport;
- administrations of river shipping.

16.6 For the providing of training are developed:

- the plan of carrying out the training with the explanatory note;
- organizational instructions for involved forces and means;
- tactical task;
- private plans of carrying out training of deputies, assistant of the training head and intermediaries;
- plan of build-up of a situation;
- plan of communication;
- plan for the management of forces and means for the teaching;
- card of draw of actions.

16.7 Preparation of the training is carried out under the direct guide of the training head. Preparation of the training is made according to the planned schedule in which provides:

- specification and definition of basic data for the training;
- terms of development of training documents;
- carrying out reconnaissance of the area of the forthcoming trainings;
- actions for preparation of the management and the intermediary bodies to the training;
- training of training participants, area of carrying out and logistic support of the training and other actions.

The planned schedule is developed by a management staff approved by the training head and carried to executives.

16.9 The order of trainings.

16.9.1 The training starts with delivery of a tactical task or an order to participants 5-7 days prior to the beginning of trainings.

During the training the head focuses on training of the corresponding heads, estimates the decisions and approves them. Actions on the training is carried out continuously on the basis of the decisions made by the trained heads and the orders made by them.

During actions the training head, his deputies, assistants and intermediaries should be together constantly with the corresponding trained participants of the training, they implement

control and estimate actions, teach them to make independent decisions.

The management staff, along with carrying out activities for actions, studies the documents developed by the trained participants of the training and estimates doctrine materials.

16.9.2 The training concludes with the analysis. The report is made following each training.

17 Requirements for the personnel of physical protection and guard units

17.1 General provisions

17.1.1 Qualifications and medical requirements for the PP personnel should be determined by the current normative legal acts and TNLA.

17.1.2 Professional training of the personnel of physical protection divisions is determined by the functions that are carried out by them and should correspond to duty regulations.

17.1.3 The persons that have the corresponding form of the admission that is made out in accordance with the established procedure are allowed to work with the state secret information about physical protection.

17.2 Requirements for the selection and training of personnel for physical protection

17.2.1 Training of PPS personnel should be directed to achievement and maintenance of a skill level necessary for performance of functional duties and actions assigned to specific categories of PPS personnel when PPS operates in regular and emergency situations.

17.2.2 The main forms of PPS personnel training are:

- basic training;
- advanced training;
- retraining.

17.2.3 Basic training should be conducted with the candidates selected for appointment to vacant positions and meeting the relevant eligibility requirements for specific categories of physical protection personnel.

17.2.4 Basic training should be carried out directly at NF according to the plan of individual training made by the head of the structural unit and approved by the head of SS NF or in training centers.

17.2.5 Programs of basic training include questions on bases of physical protection taking into account an orientation of use of the expert, his experience and level of training. The volume and terms of basic training of physical protection personnel are defined by the head of the structural unit depending on a position of the trainee, specific volume of functional duties, type and category NF.

17.2.6 The list of questions and standards conforming to qualification requirements to this category of personnel should be developed for each category of PP personnel by the head of SS or departmental protection (in its presence).

17.2.7 Basic training of PP personnel should come to the end with carrying out examination (testing) for knowledge of operational duties, an order and ways of their performance.

17.2.8 Certification of personnel should be carried out in the order established by the legislation [12] at least once in three years.

17.2.9 Advanced training of PP personnel should consist of a system of measures for in-depth training of managerial personnel and experts in the field of physical protection in order to enhance their professional knowledge and skills. .

17.2.10 Retraining and advanced training of PP personnel should be carried out in training centers of system of retraining and advanced training of staff for PPS.

17.2.11 The order of training of divisions staff of VV MIA which are carrying out protection of NI is determined by regulations of CDC VV MIA.

17.3 Requirements for the guard units

17.3.1 The order of service for the NF protection and actions of guard units in normal and emergency situations should be determined by status, manuals, instructions, other normative acts

of the MIA and (or) CDC VV MIA and the corresponding plans.

17.3.2 Guard units should be completed according to the norms and requirements established by normative acts of the MIA and (or) CDC VV MIA and be prepared for the actions directed to prevention of unauthorized penetration into the protected zones and to PPS in normal and emergency situations. Actions of guard units should be aimed at providing protection of NF against UA.

17.3.3 Preparation of governing bodies and guard units for actions at emergency situations should be carried out according to educational plans and programs.

17.3.4 Trainings and drills should be performed for improvement of interaction and check of readiness for actions in emergency situations in the terms established by legal normative acts.

18 Control over the physical protection of nuclear facilities

18.1 State control over the physical protection of NF should be implemented according to the provisions [13].

18.2 Control over operation of physical protection at the NF level is implemented with following aims:

- verification of requirements implementation of legal normative acts and TNLA on providing PP, the present technical code, as well as local normative acts of NF;
- evaluation of effectiveness of PPS NF in general, separate areas and PPSt;
- verification of compliance of the PPS structural components with the requirements;
- developments and realization of necessary measures for elimination of the shortcomings revealed during the verification.

18.3 The NF administration regularly organizes and conduct trainings of SS personnel and guard units for the purpose of verification of their effectiveness interaction with the internal affair bodies and (or) internal troops of the MIA, bodies and divisions on emergency situations, territorial divisions of the state security agencies, border services (if the facility is close to the state border of the Republic of Belarus) in emergency situations.

Appendix A

(mandatory)

Categories of nuclear materials

Table A.1

| Nuclear material type and degree of its exposure | Content of isotopes in substance (by weight) | Category (with according of mass (m), kg) | | |
|--|--|---|---|---|
| | | I | II | III |
| Plutonium ¹ unirradiated ² or weakly irradiated | no more than 80% plutonium-238 isotopes | $m \geq 2$ | $0,5 < m < 2$ | $0,015 < m \leq 0,5$ |
| Uranium-235 unirradiated ² or weakly irradiated | 20 % and more of uranium-235 isotopes | $m \geq 5$ | $1 < m < 5$ | $0,015 < m \leq 1$ |
| | from 10 to 20 % uranium-235 isotopes | – | $m \geq 10$ | $1 < m < 10$ |
| | more, than in natural uranium but less than 10% uranium-235 isotopes | – | – | $m \geq 10$ |
| Uranium-233 unirradiated or weakly irradiated | any | $m \geq 2$ | $0,5 < m < 2$ | $0,015 < m \leq 0,5$ |
| Any irradiated nuclear material including irradiated natural and depleted uranium and thorium | contents of fissile isotopes before radiation less than 10 % | – | any mass | – |
| | | – | mass, corresponding to the category I of unirradiated or weakly irradiated nuclear material | mass, corresponding to the I or II Category of unirradiated or weakly irradiated nuclear material |
| ¹ All plutonium except that with isotopic concentration exceeding 80 % in plutonium-238 ² Material unirradiated in a reactor or material irradiated in a reactor but with a radiation level equal to or less 1 Gy'h. (100 rad/h) at 1 m unshielded (unshielded) | | | | |

Appendix B

(mandatory)

Categories of consequences of unauthorized actions against nuclear facilities

Table B.1

| Categories of consequences of unauthorized actions | Scale of consequences of unauthorized actions |
|--|--|
| I | radiation effect covering one or more regions of the Republic of Belarus or beyond the territory of the Republic of Belarus |
| II | radiation effect which do not belong to the scale of I Category but may lead to radiation effect beyond the boundary of sanitary protection zone of nuclear installation and (or) storage facility |
| III | radiation effect which is beyond of rooms, buildings, constructions, but not beyond the boundary of sanitary protection zone of nuclear installation and (or) storage facility |
| <p>Note</p> <p>1 The assessment of borders of the territory which may be exposed to nuclear radiation at commission of unauthorized actions, determined taking into account existing norms for radiation safety.</p> <p>2 I and II Categories of consequences of unauthorized actions may be increased taking into account territorial location and other features of nuclear facility</p> | |

Appendix C

(mandatory)

Requirements for placement of physical protection items at a nuclear facility

| Category | Characteristic of physical protection items | Location zone of physical protection items |
|--|---|---|
| A | the presence of at least 2 indicators from the following indicators: - nuclear material – I Category - level of secrecy – top secret; - consequences of unauthorized actions – I Category | particularly important area equipped with additional engineering and technical means of physical protection (if it is necessary) |
| | the presence of significant quantity nuclear material of direct use | |
| B | the presence of at least 1 indicator from the following indicators: - nuclear material- I or II Category with possibility of accumulation to the I category; - level of secrecy – top secret - consequences of unauthorized actions – I Category | particularly important area or interior area equipped with additional engineering and technical means of physical protection (if it is necessary) |
| | the presence of at least 2 indicators from the following indicators: - nuclear material – II Category - level of secrecy – top secret; - consequences of unauthorized actions – II Category | |
| C | the presence of at least 1 indicator from the following indicators: - nuclear material – II Category - level of secrecy – top secret; - consequences of unauthorized actions – II Category | interior area |
| D | the presence of at least 1 indicator from the following indicators: - nuclear material – III Category - level of secrecy – for official use; - consequences of unauthorized actions – III Category | protected area equipped with additional engineering and technical means of physical protection (if it is necessary) |
| E | NM not related to I, II or III Categories, other physical protection items not related to A – D Categories | limited access area |
| <p>Note</p> <p>1 When the physical protection item is placed taking into account the number of nuclear material and possibility of its use for production of a nuclear explosive device and its components.</p> <p>2 The number of nuclear material sufficient for production of a nuclear explosive device is a significant number of nuclear material.</p> <p>3 Nuclear materials of direct use are materials which may be used for production of a nuclear explosive device or its components: a) without additional processing; b) without transformation or enrichment, but with insignificant additional physical or chemical processing.</p> <p>4 Need of the organization of additional engineering and technical means of physical protection and the requirement to them are defined during creation (improvement) of system of physical protection based on evaluation of its effectiveness.</p> <p>5 Level of secrecy is determined by the relevant normative legal acts.</p> | | |

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Director General

SSI "JIPNR – Sosny" NAS of Belarus

Dr. Sci. in Physics and Mathematics, Professor

V.I. Kuvshynau

Responsible executor

Cand. Sci. (Eng.)

A.P. Malykhin

In the development of the present technical code participated:

From SSI "JIPNR – Sosny" NAS of Belarus:

Senior Research Scientist

O.B. Gurko

Leading electronics engineer

M.F. Kohanau

Leading engineer on devices and equipment of NM&UPP Dep

A.A. Shkudau

Head of NM&UPP Department

G.V. Vasilevich

NM&UPP Dep Electronics engineer

S. V. Shylo

Head of Nuclear Material Use and Storage Department

A.N. Luneu