

APPLICATION OF THE VEGA-2 PROGRAM DURING CONSTRUCTION OF EFFECTIVE SECURITY SYSTEMS

Y.S.Vahrusheva

Scientific Supervisor: PhD, Associate professor B.P.Stepanov

Linguistic Advisor: Senior teacher N.V. Daneykina

Tomsk Polytechnic University, Russia, Tomsk, Lenin str., 30, 634050

E-mail: julia_vach@mail.ru

Abstract

Securing nuclear materials is paramount. State physical protection systems provide a single system for planning, coordination, monitoring and implementation of the technical and organizational measures for the timely detection of unauthorized activities and prevent them. Physical protection should be provided at all stages of design, construction, operation and decommissioning of nuclear facilities, as well as any handling of nuclear materials and radioactive substances.

The aim of this work is to create a hypothetical object, with which you can get the necessary data to assess the effectiveness with using the software "Vega-2."

Introduction

Technical means allow providing early detection of unauthorized violator, control authorized access to an object, monitoring the situation, so as part of a physical protection system they have a special role. Selection of the optimal composition of elements of PPS for a particular object in the design process is carried out through a systematic approach using a variety of performance criteria the system will perform its primary function. In this evaluation of the effectiveness of PPS is mandatory.

Evaluating the effectiveness of the security system is based on quantitative or qualitative determination of the ability of the threats identified in the analysis phase of vulnerability.

The work was aimed at evaluating the effectiveness of PPS is to evaluate the ability to provide security for physical protection from external and internal threats, taken from the analysis of the vulnerability of nuclear objects, by the repression of unauthorized violator.

Development

The main objectives in assessing the effectiveness of PPS of nuclear objects are:

- identifying the elements of PPS, overcoming the offender who is most likely to theft of nuclear materials (NM) or sabotage at nuclear facilities (NF) of the object;
- Consideration scenarios violator aimed at stealing or sabotage of nuclear materials and to identify the most probable of them;
- Identification of vulnerabilities existing PPS formally meet the requirements established in the regulations;
- Analysis of the causes of vulnerabilities in PPS;
- Assessment of the likelihood of certain preventive actions violators guard force acting on the alarm

when internal and external threats;

- Choice of optimal design decisions during the creation and improvement of PPS;
- Preparation of proposals for the administration of nuclear objects command (directing) of the security forces of nuclear objects to improve PPS and its individual structural elements, including decisions to optimize tactics of the security forces.

The main tool in assessing the effectiveness of PPS nuclear facility is a specially designed software "Vega-2." With this program you can assess and identify the full picture of the effectiveness of PPS, identify weaknesses, to reduce the likelihood of human error assumptions in the calculations and to simplify the procedure of effectiveness evaluation itself.

"Vega-2" software performs the following functions:

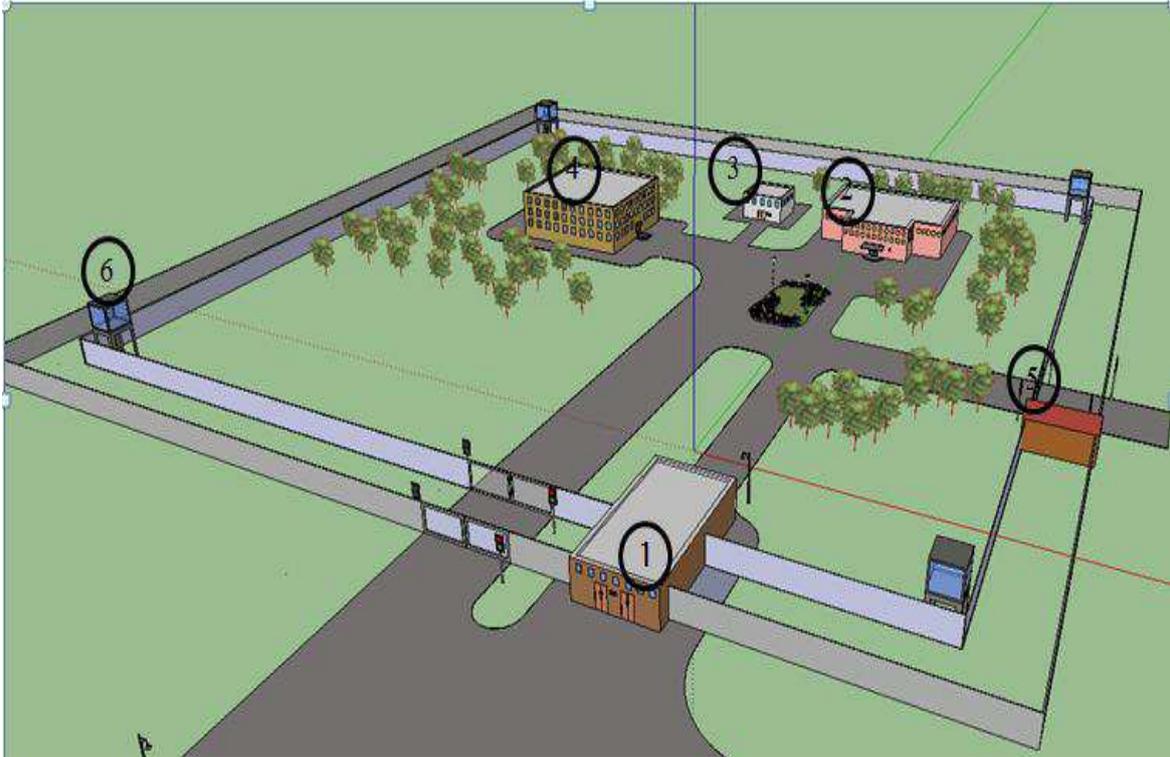
1. Construction of a formalized description of the object.
2. Automatic detection of possible ways to target the offending
3. Determining the effectiveness of PPS for each objective in two ways (analytical and simulation)
4. Representation of results of the assessment in the following ways:
 - displaying the numerical values of performance indicators PPS;
 - charting possible ways violator;
 - displaying information about critical paths;
 - recording results of the assessment.

For the most complete presentation and analysis of results of working "Vega-2" software the hypothetical nuclear facility was developed in.

As the object of scientific research we selected reactor - nuclear facility for the production of energy in a given mode and conditions of use, is located within a defined project area on which to carry out this purpose nuclear reactor complex and the necessary systems, apparatus, equipment and facilities with the necessary working personnel .

The object has a driveway and a railway track. Driveway is the most commonly used way to transport personnel to the job site. Railway track used to deliver fresh fuel and spent fuel sent to companies processing or disposal. The enterprise has an emergency exit.

The 3D - the scheme of hypothetical nuclear object



- 1 - АКПП and ЛКПП;
- 2- Reactor building;
- 3 - Management point;
- 4 - Building of the main warehouse;
- 5 - АКПП-2;
- 6 - Observation tower.

Currently, the design of various security systems are widely used methods of 3D modeling. We used this action in order to:

- 1. Visual representation of selected hypothetical object;
- 2. Visual effect with a detailed examination of the smallest details and arrangement of elements considered;
- 3. Obtain effective results and rapid elimination of defects, if found.

In this case, 3D modeling in the design of the various systems used for visualization of using software "Vega -2." The module is connected to the database by type of physical barriers and graphic description of the object module. Formalized description includes a description of the structure of the object and the location of items of physical protection as well as data from time to time to overcome the offender physical barriers and the likelihood of its detection times extension of the security forces to the borders of the physical protection of the offender and the times of movement of the security forces in sections.

Results

In order to create an effective system of physical protection in the established model visualization

hypothetical object in the 3D editor was built. With it analyzes the characteristics of the relative position of buildings, protected areas in the facility, placement of nuclear materials, elements of the complex of technical means of physical protection. Visibility resulting materials allows us to consider the possible route of offenders, changing tactics unauthorized actions in the restructuring of PPS.

Conclusion

On the basis of a formalized description of the object calculated module automatically determines the probable ways intruder (action script). For each path depending on the user evaluation of the effectiveness of the method automatically generates a graph of the situation or conducted simulation penetration offending object.

As a result of using three-dimensional graphics created specific hypothetical object, which gives a detailed description of all the necessary data to assess the effectiveness of using the software "Vega-2."

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