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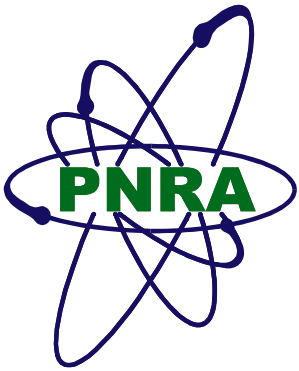

FORMAT AND CONTENT OF PHYSICAL PROTECTION PROGRAM OF NUCLEAR INSTALLATION(S)

REGULATORY GUIDE

PAKISTAN NUCLEAR REGULATORY AUTHORITY

For Further Details

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PAKISTAN NUCLEAR REGULATORY AUTHORITY
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FORMAT AND CONTENT OF PHYSICAL PROTECTION PROGRAM OF NUCLEAR INSTALLATION(S)

ABSTRACT

Regulation 8(6) of "PNRA Regulations for Licensing of Nuclear Installations in Pakistan (PAK/909) (Rev.1)" requires submission of Physical Protection Program. This regulatory guide provides standard format and content for Physical Protection Program to be prepared and submitted by the licensee.

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1. INTRODUCTION

PNRA Regulations for Licensing of Nuclear Installations in Pakistan (PAK/909) (Rev.1) requires the licensees to submit Physical Protection Program (PPP) at different stages of authorization/licensing process. However, this regulatory guide specifically addresses Regulation 8(6) of these regulations which require submission of PPP at the time of obtaining permission for introducing nuclear material into the installation(s). This guide describes the standard format and content, recommended by PNRA, for the preparation of Physical Protection Program by the licensee.

Licensee should prepare its Physical Protection Program in accordance with the format and content as prescribed in this document. The Physical Protection Program should at least consist of the following plans along with their implementing procedures:

i. Physical Protection Plan
ii. Contingency Plan
iii. Information Security Plan
iv. Transport Security Plan

The information to be provided/submitted by the licensee, related to the installed physical protection system and measures at the facility, should be up to date.

2. OBJECTIVE

This regulatory guide has been prepared to provide guidance to the licensees on format and content of Physical Protection Program of nuclear installation(s).

3. SCOPE

The guidance provided is applicable to nuclear installation(s) only, for the development of their Physical Protection Program in accordance with the format and content prescribed in this document.

4. FORMAT AND CONTENT OF PHYSICAL PROTECTION PROGRAM

4.1 General Instructions for Preparation of Physical Protection Program

The licensee should follow the following instructions while preparation of Physical Protection Program:

i. The licensee should provide clear, concise and latest/updated information.
ii. A table of content should be included for each submission.
iii. Definitions and abbreviations should be consistent throughout the submission.
iv. Duplication of information should be avoided. In case where necessary, reference of relevant section should be made.

v. Legible drawings, diagrams, maps, and tables should be added wherever necessary with proper reference.

The licensee should submit its Physical Protection Program to the Authority in accordance with the content given in subsequent sections. Sections 4.6 to Section 4.10 are applicable to all the plans to be submitted under PPP.

4.2 Physical Protection Plan

The following sections describe, in general terms, the content and level of detail that should be included in a physical protection plan:

4.2.1 Introduction

In this section, the licensee should briefly introduce the physical protection plan.

4.2.2 Scope and Objectives

In this section, the licensee should define the scope and objectives of the physical protection plan.

4.2.3 Facility Description

In this section, the licensee should describe the type of facility to be operated and the general layout of the facility and its surrounding area. This section should include a map of the entire facility showing surrounding areas (e.g. transportation routes, pipelines, public places, industry, etc) and illustrations as appropriate.

4.2.4 Security Areas

In this section, the licensee should include description of limited access area, protected area, vital area and isolation zone describing access points, physical barriers, structures and their locations with spatial relationship in the facility. The licensee should provide scaled drawings which are properly labeled showing locations of physical protection systems, subsystems, and major components, vital areas, entry/exit control points and alarm stations.

4.2.5 Identification of Vital Areas

In this section, the licensee should identify and list down the vital areas containing equipment, systems or devices, or nuclear material, the sabotage of which could directly or indirectly lead to high radiological consequences.

4.2.6 Design of Physical Protection System

In this section, the licensee should provide the detailed design features of physical

protection systems according to the sequence given below:

4.2.6.1 Detection

4.2.6.1.1 Intrusion Detection System

In this section, the licensee should describe the arrangements to detect intrusion into the protected area boundary including equipment types, associated detection capabilities with technical and operational details.

The licensee should also provide the details of the intrusion detection systems installed anywhere else at the facility.

4.2.6.1.2 Assessment & Surveillance System

In this section, the licensee should describe the detail of assessment systems of the protected area (including isolation zone) to detect and deter intruders and to ensure the integrity of installed physical protection systems. This should include, but not limited to, the type of equipment used, performance evaluation, operational detail and a diagram showing their locations and field of view. Assessment system installed at other locations at the facility for physical protection purpose should also be described.

Details of surveillance system installed at the facility including equipment type, performance evaluation, operational detail and a diagram showing their locations and field of view should also be provided in this section.

4.2.6.1.3 Illumination System

In this section, the licensee should describe the illumination system at the facility with sufficient details including types of lights, installation criteria and schematic layout.

4.2.6.2 Delay

4.2.6.2.1 Description of Physical Barriers

In this section, the licensee should identify and provide analysis of site specific conditions to determine the specific type, structure, use, locations, functions, and placement of physical barriers at limited access area, protected area and vital areas.

4.2.6.2.2 Security Post and Structures

In this section, the licensee should describe the location and purpose of all permanent security posts and structures including description of their physical construction.

4.2.7 Alarm Stations

In this section, the licensee should describe the location, layout and design of the central and secondary alarm stations and methods used for annunciation of required alarms. This section should also describe available/applied protection measures for the stations and arrangements for the following aspects should be addressed:

i. Monitoring and assessment of alarms;
ii. Initiation and coordination of response;
iii. Command and control mechanism.

4.2.8 Power Sources

In this section, the licensee should describe the sources (with adequate details) of standby, backup and/or alternate power for uninterrupted operation of all security equipment.

4.2.9 Communication Systems

In this section, the licensee should describe the capability of continuous redundant and diverse communication systems for implementation of PPP. This description should also include information on:

i. Type of communication system;
ii. Availability of communication system on a 24-hour basis;
iii. Reliable and secure communication system.

4.2.10 Access Control and Search Systems

4.2.10.1 Access Control Locations

In this section, the licensee should describe the locations of the access control points for personnel, packages and vehicles entering and exiting security areas (limited area, protected area and vital areas).

4.2.10.2 Access Authorization

In this section, the licensee should describe the criteria used for authorizing escorted and unescorted personnel access. The licensee should also describe criteria for contraband and vehicles access authorization.

4.2.10.3 Identification System

In this section, the licensee should describe the measures for establishing the identity (picture card, biometric system, finger print recognition system, etc.) of personnel at each Entry/Exit Control Point (EECP).

4.2.10.4 Search Program

In this section, the licensee should describe the process and methods for searching personnel, vehicles, and packages before granting entry/exit to designated facility areas under both normal and emergency condition.

4.2.10.5 Key, Locks and Combinations

In this section, the licensee should describe the measures for controlling the keys, locks combinations and related equipment used to control access to protected, vital, and any other area where access is required to be controlled.

4.2.10.6 Access Control during Emergency Conditions

In this section, the licensee should describe the location of all emergency exits and the employed access control measures. This section should also describe the licensee's mechanism for control of rapid entry or exit of authorized individuals, vehicles and equipment during emergency conditions.

4.2.11 Sustainability Program

In this section, the licensee should describe the sustainability program of Physical Protection System (PPS) installed at nuclear installation. The sustainability program should encompass:

i. Operating procedures (instructions);
ii. Human resource management and training;
iii. Performance testing and operational monitoring;
iv. Configuration management (the process of identifying and documenting the characteristics of a facility's PPS including computer systems and software and of ensuring that changes to these characteristics are properly developed, assessed, approved, issued, implemented, verified, recorded and incorporated into the facility documentation);
v. Resource allocation and operational cost analysis.

4.2.12 Maintenance and Testing Program

In this section, the licensee should describe the testing (operation and performance) and maintenance (preventive and corrective) program for intrusion detection system, communication and assessment systems, access control system, and their associated other physical protection equipment. This description should include the purpose and the intended level of testing and maintenance program. In addition, specific methods for testing each type of equipment should be included in the description along with testing frequency.

4.2.13 Management System

4.2.13.1 Management System and Security Organization

In this section, the licensee should describe its management system for PPP. This section should also describe the hierarchy of security organization and its relationship with the overall management structure of the facility. Security responsibilities and the chain of command for decision making on security matters should be included.

4.2.13.2 Training Plan

In this section, the licensee should provide training and retraining plan for security force (Including Quick Response Force (QRF)), technical personnel for physical protection systems and other persons having direct responsibility for the implementation of Physical Protection Plan.

4.2.14 Evaluation

In this section, the licensee should describe the methodologies for evaluation of PPP (including drills/exercises) to determine the degree of effectiveness of security measures, procedures, personnel, and equipment.

This section should also state the frequency of evaluation of PPP and describe the scenarios for drills/exercises.

4.2.15 Preventive and Protective Measures Against Insider Threat at the Facility

In this section, the licensee should describe the set of preventive and protective measures against insider threat at the facility.

4.2.16 Compensatory Measures

In this section, the licensee should describe compensatory measures to be taken in the event of a degraded or inoperable equipment, component or system of PPS.

4.2.17 Safety and Physical Protection Interface

In this section, the licensee should address physical protection interface with safety in a manner to ensure that they do not adversely affect each other and that, to the degree possible, they are mutually supportive.

4.2.18 Protection of Computers and Networks

In this section, the licensee should describe its measures to protect computers and networks important to safety and physical protection (e.g. cyber attacks, manipulation or falsification, etc.).

4.2.19 Records

In this section, the licensee should describe arrangements to ensure that retrievable and up-to-date records necessary for Physical Protection Plan are maintained. The records to be maintained may include the following:

i. Personnel access authorization/termination records;
ii. Training and re-training records;
iii. Vehicle access records;
iv. Patrolling records;
v. Tests and maintenance records;
vi. Control room related records;
vii. Records of audits and reviews;
viii. Records of security related event(s); and
ix. Any other.

4.3 Contingency Plan

The contingency plan should describe the types of contingencies, licensee's response arrangements, and coordination with offsite authorities and its interfaces with other emergency plans of the facility. This should also identify the responders; specify their responsibilities and response actions.

Following sections describe the content and level of detail that should be included within a contingency plan:

4.3.1 Introduction

In this section, the licensee should briefly introduce the contingency plan.

4.3.2 Scope and Objectives

In this section, the licensee should describe the scope and objectives of the contingency plan.

4.3.3 Anticipated Events Warranting Contingency Planning

In this section, licensee should identify all possible events along with different scenarios requiring a coordinated response action(s) covering at least following situations:

i. Bomb threats
ii. Sabotage attempts
iii. Attack threats, fire, explosion, or other catastrophe

iv. Civil disturbance
v. Communications failure
vi. Perimeter and protected area intrusion
vii. Internal disturbance
viii. Vital area intrusion

For each event identified, specify the objective to be accomplished during the potential response activities.

4.3.4 Response Arrangements

In this section, the licensee should describe its arrangement to interdict and neutralize the adversary during all the events described in section 4.3.3 by properly trained, qualified, and adequately equipped personnel available at all times.

This section should also describe chain of command and roles & responsibilities of the security personnel during the event.

In this section, the licensee should describe its arrangements to cooperate and coordinate with all organizations having responsibilities to cater security contingencies at national level.

4.3.5 Interface with Radiological Emergency Plan

In this section, the licensee should describe the arrangements to ensure the effective integration and interface of contingency plan with emergency plan.

4.4 Information Security Plan

This plan contains measures for the protection of information related to the physical protection program. The format and content of information security plan are as follows:

4.4.1 Introduction

In this section, the licensee should briefly introduce the information security plan.

4.4.2 Scope and Objective

In this section, the licensee should describe the scope and objective of the information security plan.

4.4.3 Identification and Classification of Information

In this section, the licensee should identify the sensitive information and describe the

criteria for classification of this information.

4.4.4 Access to Information

In this section, the licensee should describe the criteria for access to information along with their implementing details.

4.4.5 Information Protection Measures

In this section, the licensee should describe the measures for the protection of sensitive information both in hard and soft form. This should include measures during information generation, communication (internal and external) and storage, etc.

4.5 Transport Security Plan

The licensee should submit transport security plan that contains detailed physical protection measures to prevent unauthorized removal of nuclear material or sabotage during transport. The format and content of transport security plan is as follows:

4.5.1 Introduction

In this section, the licensee should briefly introduce the transport security plan.

4.5.2 Scope and Objective

In this section, the licensee should describe the scope and objective of the transport security plan.

4.5.3 Roles and Responsibilities

In this section, the licensee should identify and describe the roles and responsibilities of the individuals involved in the transportation. The licensee should also describe the change over protocols for individual responsible during transport.

4.5.4 Description of Vehicle and Package

In this section, the licensee should describe the mode of shipment, detailed description of vehicle or vessel such as type, identification, installed security system, etc.

This section should also include description of material (radionuclide, category, physical form, degree of enrichment, isotopic composition, radiation levels, etc.) and identification of transport package (Transport/ Criticality Index, etc).

4.5.5 Threat Information

In this section, the licensee should include arrangements for identification and

assessment of threats related to transport of nuclear material.

4.5.6 Security Measures during Transport

In this section, the licensee should provide a detailed description of all of the proposed security measures adequate to provide security during the transport of the nuclear material.

4.5.7 Assistance from Offsite Authorities

In this section, the licensee should describe its arrangements to cooperate and coordinate with all organizations having responsibilities related to transport.

4.5.8 Communication Arrangements

In this section, the licensee should provide details of equipment and procedures for two-way communications between the transport incharge and the response center to rapidly and accurately transmit assessed information and coordinate for assistance. This section should also include limitations of communications during transport.

4.5.9 Search Prior to Transportation

In this section, the licensee should describe the arrangements to ensure that the integrity of the shipment containers and associated locks or seals is checked prior to transportation.

4.5.10 Testing and Evaluating the Transport Security Plan

In this section, the licensee should describe details of limited and full-scope drills and exercises designed to evaluate the Transport Security Plan and detect weaknesses (if any) in the system on a pre-determined frequency.

4.6 Implementing Procedures

The licensee should prepare operating procedures for the implementation of this program. The licensee need not to submit these procedures but should provide list of relevant procedures at the end of each plan in Annexure. The procedures may include the following:

i. Physical protection system operations procedure;
ii. Access control and authorization procedure;
iii. Procedure for search of individuals and vehicles;
iv. Security alert procedure;
v. Security briefing procedure;

vi. Procedure for development, modification and review of Physical Protection Program;
vii. Procedure for use and operation of personal equipment for normal and contingency operations;
viii. Procedure for engagement and operation of response force;
ix. Procedure for escort and patrol;
x. Procedure for coordination with local law enforcement agencies;
xi. Procedure for event reporting;
xii. Procedure for equipment testing and maintenance.

4.7 Quality Assurance

In this section, the licensee should include the description of the quality assurance arrangements for the physical protection systems and measures.

4.8 Review, Evaluation and Audit

In this section, the licensee should describe the process of review, evaluation and audit of the plans submitted under physical protection program to determine their effectiveness. This should also include the periodicity of the review, evaluation and audit.

4.9 Event Reporting

In this section, the licensee should describe reporting mechanism for reporting of an event involving actual or attempted unauthorized access, unauthorized removal of nuclear material or sabotage. Preliminary report submitted to the Authority should be as per format given in Annexure - I.

4.10 References, Code/Standards, Tables and Annexes

In this section, the licensee should include all applicable references, codes and standards, tables and annexures necessary for plans submitted under physical protection program.

4.11 Definitions and Abbreviations

In this section, the licensee should include alphabetically the list of terms and the corresponding definitions and abbreviations used in describing the operational and technical aspects of the plans submitted under Physical Protection Program.

5. REFERENCES

1. Regulations on Licensing of Nuclear Installations in Pakistan - PAK/909 (Rev.1)
2. U.S. Nuclear Regulatory Commission (NRC), 10CFR Part 73.55: Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors against Radiological Sabotage
3. U.S. Nuclear Regulatory Commission (NRC), NUREG 0800 - Standard review Plan (13.6.1): Physical Security - Combined License and Operating Reactors
4. IAEA Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev. 5)

ANNEXURE – I

EVENT REPORTING FORM

Name of the Facility:	
Reporting Officer:	
Contact Details:	
Event Date and Time:	
2. Event Description	
Please provide detail:	
3. Potential/ Actual Impact	
Please provide detail:	
4. Who Else Has Been Notified?	
Please provide detail:	

5. What Steps Have Been Taken So Far?(Check one or more that apply to this incident)	
☐ Corrective action has been taken ☐ Timely response made to the incident ☐ Physical protection system rectified/restored	☐ Facility has been secured ☐ No action taken ☐ Other (please describe below)
Provide a brief description:	

6. Additional Information
Please provide any additional information that you feel is important but has not been provided elsewhere on this form.
Signature of the Sender: ----------

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