

## PHYSICAL PROTECTION SYSTEMS AND Y2K ISSUE IN THE SLOVAK REPUBLIC

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### Abstract

After political and economical changes in the end of eighties the utility operating nuclear power plants in the Slovak Republic (SE, a.s.) decided to upgrade physical protection system of nuclear installations. System based on guards (army, police) was replaced by sophisticated one comprising barriers with detection and controlled by computers. Due to date format used by control software the utility is facing a problems approaching the year 2000.

### 1. INTRODUCTION

Starting with commercial operation of the first nuclear power plant (NPP) in Slovakia the system of physical protection was based on the army forces guarding outer fence of NPP and police forces guarding entrances into the NPP. This system was not very sophisticated but effective enough in the socialism era. In eighties the government of the former Czechoslovakia recognised necessity to upgrade this system up to the level usual in developed western countries. As a pilot project NPP Dukovany, now in the Czech Republic, was equipped with highly automated protection system – so called AKOBOJE (Automated Complex of Security Protection of NPP) based on hardware produced in Czechoslovakia.

After political changes in 1989 NPPs in Slovakia decided to co-operate with experienced western companies in upgrading physical protection systems – so that fully automated PC based system for NPP Jaslovské Bohunice was supplied by the consortium Thermatom/Cegelec and for NPP Mochovce by company Landys and Gyr.

### 2. PROBLEM DESCRIPTION AND SOLUTION

#### 2.1 Description of physical protection system

##### 2.1.1 Categorization

Physical protection system in both NPPs is based on principles developed for NPP Dukovany. According to the Regulation No. 100/1989 on physical protection of nuclear facilities and nuclear materials (based on principles of INFCIRC/225) technological systems and nuclear materials were categorised into three categories – first one most sensitive. Due to deficiencies of the NPPs soviet design an area of each NPP was also divided into three zones and the first category technology and material was located into inner area.

##### 2.1.2 Barriers

- (1) *Guarded area* is limited by barriers in the form of isolation zone equipped with two independent detection systems and monitored by TV system,
- (2) *Protected area* is limited by barriers equipped with single detection system and monitored by TV system,
- (3) *Inner area* is located inside buildings with concrete walls equipped with detection on doors, protected windows and ducts.

##### 2.1.3 Entrances

Entrances are equipped with locked doors, doors with magnetic lock or turnstiles controlled by card readers. Entrances into inner area are guarded.

#### 2.1.4 Software

The physical protection system is controlled through sophisticated software supplied by system vendor. The software runs on efficient PC based computers located at the AKOBOJE main control room.

#### 2.1.5 Personnel

The AKOBOJE system is operated by NPPs operators. Entrances are guarded by private security guards which also perform mobile patrol inside the NPP. Response forces are created by the state police.

### 2.2 Year 2000 induced problems

The problem with the year 2000 is caused by the above mentioned software. Each system event (signals from detectors, card readers, turnstiles, doors, etc) is recorded into extensive databases together with information about time and date. The date information, unfortunately, is in the format with two digits for year. Therefore transition to the year 2000 could cause malfunction of this system when, for instance, processing "anti-pass-back" function or evaluating presence of persons in some locations in case of emergency.

Moreover an access to the operation system is secured by a password which also contains time information and, unfortunately, dates containing years over 1999 will not be accepted.

Operators of the physical protection system in both NPPs are aware of these problems and prepared together with the utility SE a schedule for their solution. Modification of the software will be performed with assistance of the original software suppliers till the end of 1999. The software vendor has to proof all changes and certify modified software. This certificate will be one of conditions required by the regulatory authority for approval of the modified software application.

### 3. CONCLUSION

The computerised systems for physical protection of nuclear facilities in the Slovak Republic use the date in a format with two digits for year therefor transition to the year 2000 could cause serious problems. The ÚJD SR and operators of the NPPs are aware of this problem and prepared a proper remedial action to cope with it during the year 1999.

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## LEGAL FRAMEWORK:

1. ACT No. 130/1998  
ON PEACEFUL USE OF NUCLEAR ENERGY

OPERATOR IS RESPONSIBLE FOR PHYSICAL PROTECTION OF  
NUCLEAR FACILITY

2. REGULATION No. 100/1989  
ON PHYSICAL PROTECTION OF NUCLEAR FACILITIES AND  
NUCLEAR MATERIAL

## PHYSICAL PROTECTION SYSTEM AT NUCLEAR FACILITIES IN SLOVAKIA

GUARDS (ARMY) ==> AUTOMATED SYSTEM  
(TILL EIGHTIES) (TODAY)

## AUTOMATED SYSTEM "AKOBOJE"

### **BARRIERS:**

(1) GUARDED AREA (Category III) - barriers in the form of isolation zone equipped with two independent detection systems and monitored by TV system

# AUTOMATED SYSTEM "AKOBOJE"

(CONT.)

(2) PROTECTED AREA (Category II) - barrier equipped with single detection system and monitored by TV system

(3) INNER AREA (Category I) - inside buildings with concrete walls equipped with detection on doors, protected windows and ducts

## **PERSONNEL:**

- AKOBOJE system is operated by NPP OPERATORS
- ENTRANCES are guarded by PRIVATE SECURITY GUARDS which also perform MOBILE PATROL inside the NPP
- RESPONSE FORCES are created by the STATE POLICE

## **SOFTWARE: (PROBLEM)**

- Software runs on efficient PC based computers located at the AKOBOJE main control room
- Each system event (signals from detectors, card readers, turnstiles, doors, etc) is recorded into databases together with information about time and **date**
- The **date** in the format with **two digits for year**

## **SOLUTION:**

- Together with a system vendor
- Till October 1999