



**REPUBLIC OF CROATIA
STATE OFFICE FOR NUCLEAR SAFETY**



CONTROL OF NUCLEAR MATERIAL AND SPECIAL EQUIPMENT IN THE REPUBLIC OF CROATIA

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JRC Information Day in Zagreb, Croatia**

Croatian regulations on Nuclear Safety



- **Nuclear Safety Act (*Official Gazette No. 173/03*)**
- **Act on Liability for Nuclear Damage (*Official Gazette No. 143/98*)**
- **Ordinance on the performing nuclear activities (*Official Gazette No. 74/06*)**
- **Ordinance on the special conditions which must be fulfilled by the expert organizations for performing activities in the field of nuclear safety (*Official Gazette No. 74/06*)**
- **Ordinance on the control of nuclear material and special equipment (*Official Gazette No. 15/08*)**
- **In preparation: Ordinance on conditions for nuclear safety and protection with regard to the siting, planning, construction, operation and decommissioning of a facility in which a nuclear activity is to be performed**



SONS - Introduction



- **At the end of 2003 the Nuclear Safety Act came into force (*Official Gazette No. 173/03*)**
- **The Nuclear Safety Act regulates safety and protective measures for using nuclear materials and specified equipment and performing nuclear activities, and establishes the State Office for Nuclear Safety**
- **The independent nuclear safety authority (State Office for Nuclear Safety - SONS) has been physically established in June 2005, based on the Nuclear Safety Act from 2003**
- **According to the Article 32, paragraph 2 of the Act, SONS took over responsibility for activities relating to nuclear safety and cooperation with the International Atomic Energy Agency (IAEA) from Ministry of Economy, Labour and Entrepreneurship**



SONS - Introduction



Responsibilities, scope, activities of SONS can be grouped as follow:

- affairs connected to nuclear activities and facilities,
- affairs connected to nuclear material and equipment,
- affairs connected to international co-operation and obligations,
- inspection,
- preparedness in the case of a nuclear accident and
- legal and general affairs



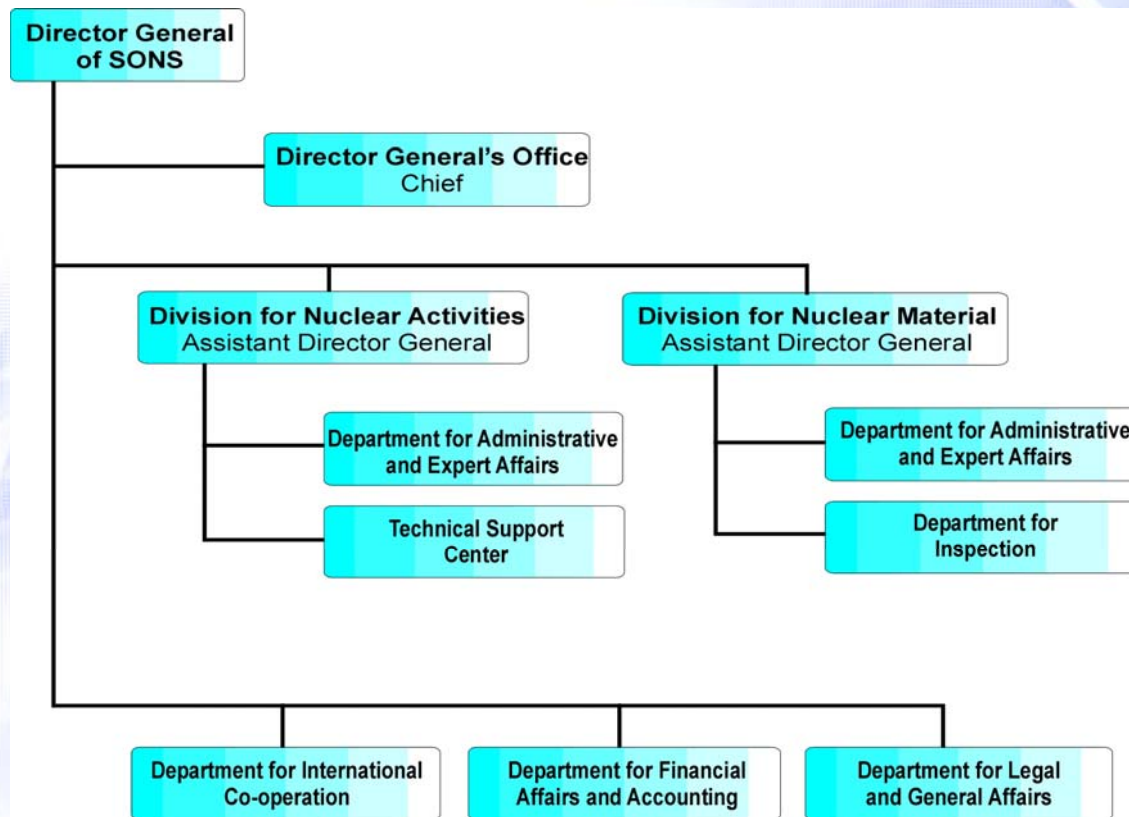
SONS - Introduction



- All together 18 working places are foreseen.
- SONS is managed by Director General
- Divisions are managed by Assistants Director
- Director General and his assistants are appointed by the Government of the Republic of Croatia.
- In the case of conducting permanent or occasional expert work, SONS co-operates with expert organizations which have special capacities for certain fields of its responsibilities.



SONS - Introduction



SONS - Responsibilities



- **What are our responsibilities?**
- issue licences for nuclear activities,
- conduct independent safety analyses,
- keep records and registers,
- carry out administrative supervision,
- carry out inspections,
- **ensure expert assistance in the event of a nuclear accident, and for preventing illicit trafficking of nuclear material,**
- monitor safety conditions at nuclear power plants in the region,
- fulfil the international obligations of the Republic of Croatia concerning nuclear safety including nuclear non-proliferation,
- cooperate with international and domestic organizations and associations,
- coordinate technical cooperation with the International Atomic Energy Agency for all participants from Republic of Croatia,
- stimulate and support research and development activities,
- issue instructions for implementing of international recommendations and standards,
- cooperation with CTBTO.



SONS – Responsibilities (Cont'd)

- **Scope of activities of SONS is further prescribed by provisions of Articles 27 and 28 of the Act in which SONS is obliged to carry out administrative supervision and inspections.**
- **Based on the Article 18 of the Act on Liability for Nuclear Damage (Official Gazette No. 143/98) SONS is responsible for conducting the supervision of the carrier of a nuclear material in connection with his insurance of the liability for nuclear damage, as stated in the Vienna Convention on Civil Liability for Nuclear Damage.**



SONS – Responsibilities (Cont'd)



Beside Vienna Convention (Official Gazette – International Agreements NN-MU No. 12/93), SONS is directly responsible for implementing next international agreements:

- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (NN-MU No. 12/93),**
- Treaty on the Non-proliferation of Nuclear Weapons (NN-MU No. 12/93),**
- Agreement Between the Republic of Croatia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-proliferation of Nuclear Weapons (NN-MU No. 13/94),**



SONS – Responsibilities (Cont'd)



- **The Protocol Additional to the Agreement Between the Republic of Croatia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-proliferation of Nuclear Weapons (NN-MU No. 7/00),**
- **Convention on the Physical Protection of Nuclear Material (NN-MU No. 12/93),**
- **Convention on Early Notification of a Nuclear Accident (NN-MU No. 12/93),**
- **Convention on Assistance in the Case of a Nuclear Accident of Radiological Emergency (NN-MU No. 12/93),**
- **Convention on Nuclear Safety (NN-MU No. 13/95),**
- **Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (NN-MU No. 3/99),**



SONS – Responsibilities (Cont'd)



- .Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the International Atomic Energy Agency to the Government of the Republic of Croatia (NN-MU No. 9/97),**
- .Agreement Between the Republic of Croatia and the Republic of Slovenia on the Early Exchange of Information in the Event of a Radiological Emergency (NN-MU No. 9/98),**
- .Agreement Between the Government of the Republic of Croatia and the Government of the Republic of Hungary on the Early Exchange of Information in the Event of a Radiological Emergency (NN-MU No. 11/99),**
- .Convention on the Privileges and Immunities of UN and Convention on the Privileges and Immunities of Specialized Agencies (NN-MU No. 12/93 , 10/99),**



SONS – Responsibilities (Cont'd)



- .Statute of the International Atomic Energy Agency (IAEA) (NN-MU No. 6/94 and 8/00),**
- .Comprehensive Nuclear Test-Ban Treaty (NN-MU No. 1/01),**
- .SONS is directly responsible for the co-operation with Nuclear Suppliers Group (NSG), and monitor the work of other international regimes for the control of dual-use equipment, especially of Wassenaar Arrangement**



Quality Assurance – Quality Management



Based on Nuclear Safety Act, SONS prepared and implemented the Quality Management System based on ISO 9001:2000 and Environmental Management System based on ISO 14001:2004

The Certification is done by SGS Switzerland in October 2006 and in October 2007.

The scope of the Certification are:

Administrative, expert, technical and inspection activities in the field of nuclear safety and security; emergency planning and preparedness; international technical cooperation; activities related to safeguards and nuclear non-proliferation



ISO 9001:2000 Certificate



SONS - FINANCING



- **SONS, as independent state administration body, is financed from the state budget. In the case of eventual special costs for the licences and approvals, for example the costs of additional independent safety analyses, Act gives possibility of asking the applicant to borne that costs.**



Bregana project



- Movement of all nuclear and other radioactive materials - subject to high standards of regulatory, administrative, safety and engineering controls
- Nuclear material – Physical protection – Nuclear proliferation
- Experiences in illicit trafficking of nuclear and other radioactive materials (ITDB)
- States have the responsibility for combating illicit trafficking and inadvertent movements of nuclear and other radioactive materials.



Illicit Trafficking ↔ State Office for Nuclear Safety

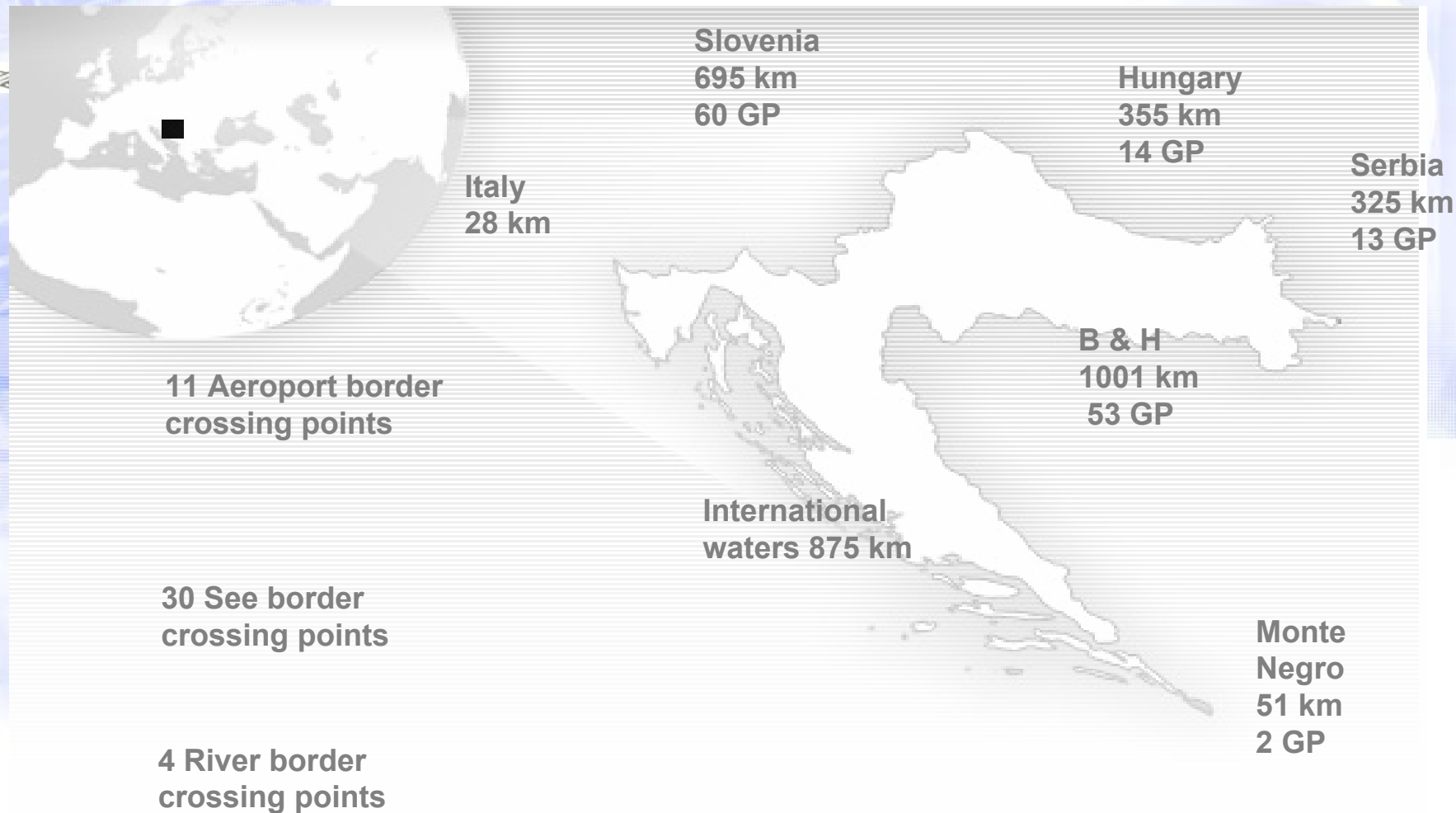


- **Control of nuclear materials – Illicit trafficking**

- Project Bregana (installation of portal monitors for control of nuclear and other radioactive materials)
- Education of custom and border police officers



STATE BORDERS OF THE REPUBLIC OF CROATIA



Location and Purpose (1)

- Border Crossing Bregana
- 24 km away from Zagreb
- Technical cooperation with IAEA
- Pilot Project
- Testing of equipment
- Testing of procedures
- Training of personal



Location and Purpose (2)



- **Continuous automated radiation monitoring vehicles, cargo, and persons**
- **On-line display of the results**
- **Archiving of alarm events and anomalies**
- **Software support of decision-making by the operator**
- **Location and identification of nuclear and radioactive materials**
- **Verification of declared radiation characteristics of fissionable and radioactive materials without opening containers**



Monitoring System



- Yantar 2U
- 2 Independent System Installed (car&truck pass)
- 100% of truck traffic (entrance)
- 70-80% of car traffic (entrance)



Components of the System



- Radiation monitors Yantar
- Video registration system
- Data collection equipment
- Database server and workstations
- Hand-held radiometers-spectrometers MKC-A02
- Physical Protection Devices



CAR PASS



07/11/2006

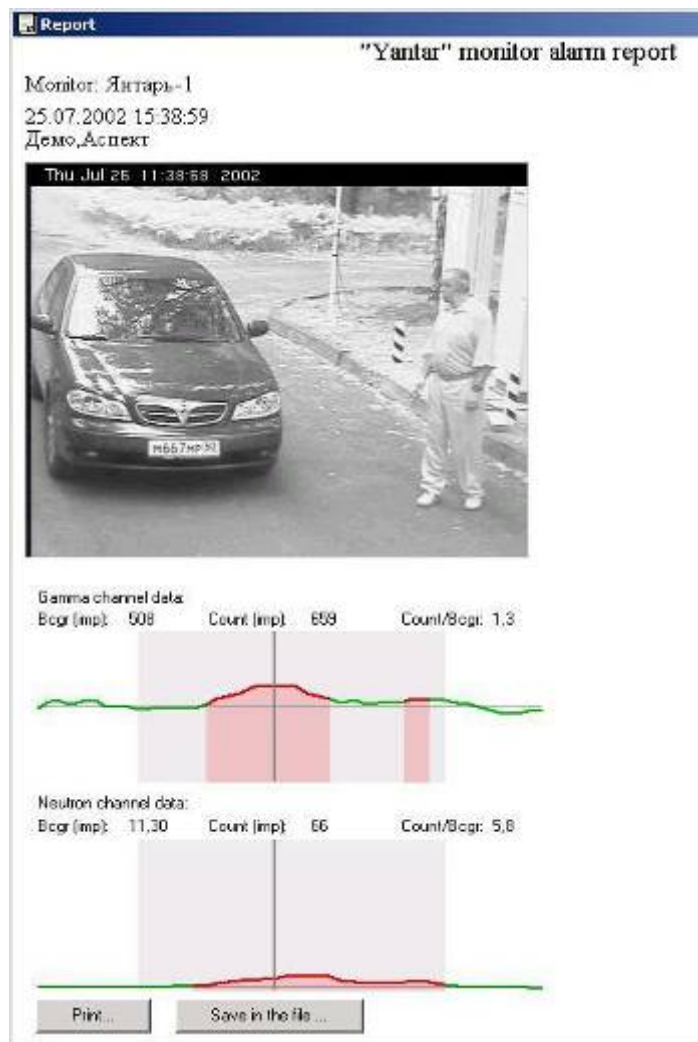


CONTROL ROOM



Alarm Reports

- Video frame
- Object profile
- Custom fields
- Comments



Nuclear and other radioactive materials control



- Statistically analyzed data
- 2 border crossing
- 4 month operation
- Total number of 1473 alarms
- 1395 alarms from the truck pass
- 78 alarms from the car pass



Results of Analysis (1)

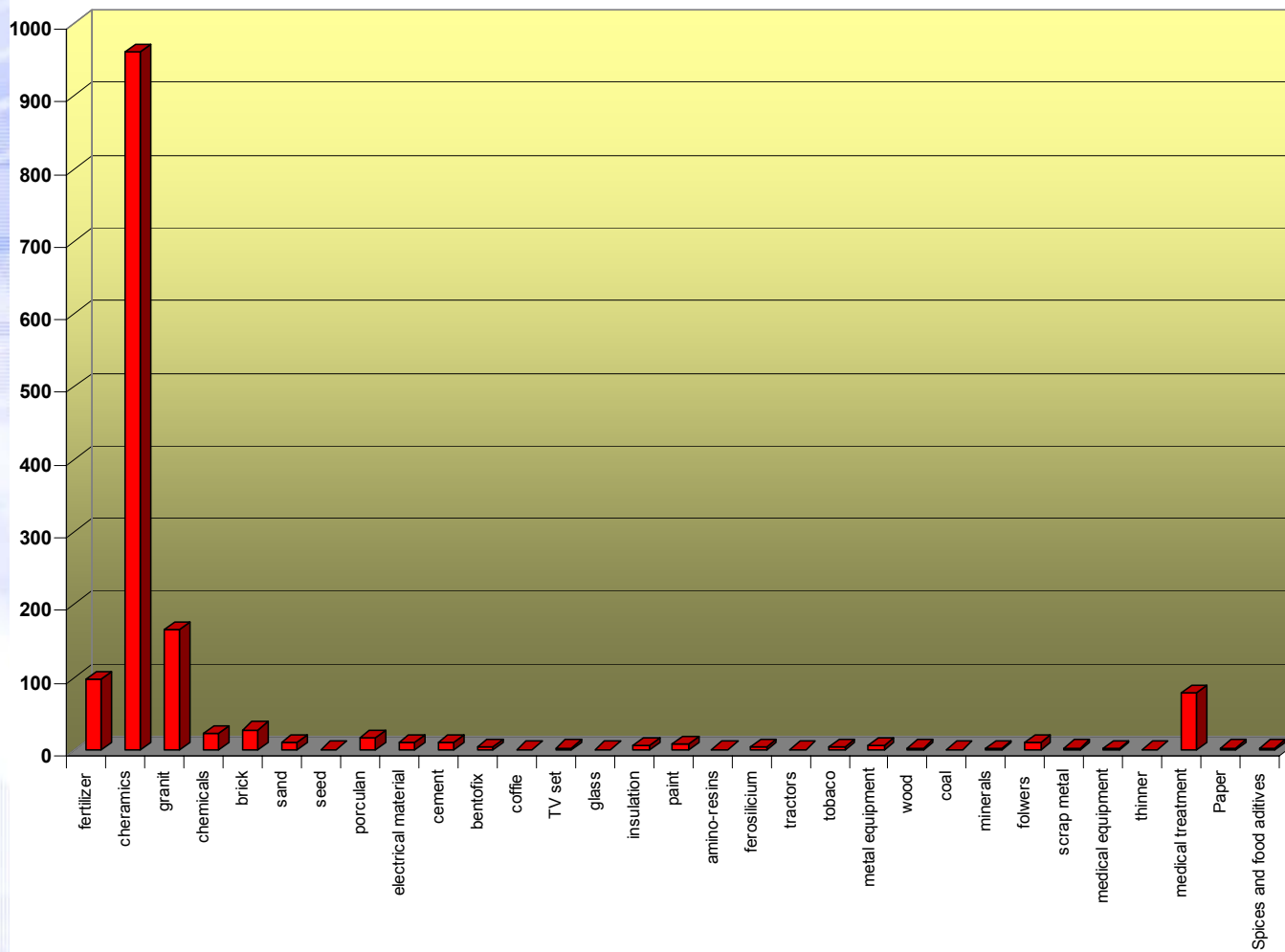
- Approximately 13 alarms per day (0,7 per day on car pass)
- 31 different type of material
- 65 % ceramics
- 11 % granite
- 6 % fertilizers
- 5 % medical treatment
- Scrap metal (3 alarms)

No.	Type of material	Total No. Alarms	%
1	fertilizer	98	6,65%
2	cheramics	961	65,24%
3	granit	165	11,20%
4	chemicals	22	1,49%
5	brick	28	1,90%
6	sand	11	0,75%
7	seed	1	0,07%
8	porculan	16	1,09%
9	electrical material	11	0,75%
10	cement	10	0,68%
11	bentofix	4	0,27%
12	coffie	1	0,07%
13	TV set	3	0,20%
14	glass	1	0,07%
15	insulation	7	0,48%
16	paint	9	0,61%
17	amino-resins	1	0,07%
18	ferosilicium	5	0,34%
19	tractors	1	0,07%
20	tobaco	5	0,34%
21	metal equipment	7	0,48%
22	wood	3	0,20%
23	coal	1	0,07%
24	minerals	2	0,14%
25	folwers	10	0,68%
26	scrap metal	3	0,20%
27	medical equipment	2	0,14%
28	thinner	1	0,07%
29	medical treatment	78	5,30%
30	Paper	3	0,20%
31	Spices and food aditives	3	0,20%
TOTAL		1473	



Results of Analysis (2)

Total number of alarms



Conclusion

- **States have the responsibility for combating illicit trafficking and inadvertent movements of nuclear and other radioactive materials;**
- **State Office for Nuclear Safety ensure expert assistance for preventing illicit trafficking of nuclear material;**
- **Project Bregana (installation of portal monitors for control of nuclear and other radioactive materials);**
- **Yantar 2U, Sophisticated equipment, high sensitivity;**
- **Pilot Project (testing equipment and procedures, training of personnel);**
- **Approximately 13 alarms per day (0,7 per day on car pass);**
- **Total number of 1473 alarms i 4 months**
- **31 different type of material;**
- **Min alarm 40% over background, Max alarm over 100 times over background**



Thank you for your attention!

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