

Radiation monitoring network of the Slovak Hydrometeorological Institute

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History

The extensive development of peace using nuclear energy after the world war II and the tests of nuclear weapons in the 50ies caused the remarkable increasing of artificial radioactivity in the atmosphere. Therefore many hygienic and meteorological services have started to monitor radiation.

In 1962 the department „Radiation of atmosphere“ has been established under the Hydrometeorological Institute in Bratislava. Artificial beta radiation of atmospheric deposition has been measured in the selected meteorological stations from 1962 to 1991. In 1991 the measurmets of dose rate started with detectors FAG.

In 2000 Centre of Partial monitoring system „Radioactivity of environment“ was established on SHMI. Radiation monitoring network is one part of Radiation monitoring network of Slovak Republic.

Monitoring of gamma dose rate

At present SHMI operates in its monitoring network 23 detectors GammaTracer fy Genitron, one mobile detector and one stanby detector. All activ detectors are placed in the professional meteorological stations in the selected parts of Slovakia. First one of these detectors was installed in 1999 and they replaced former type of detector (FAG). Last two detectors were installed in 2002. Detector GammaTracer has range of measurement from 20nSv/h to 10 Sv/h.

The detectors are calibrated every 2 years in the Slovak Institute of Metrology in compliance with the calibration plan.

Aerosol monitors

SHMI operates 4 aerosol monitors in Hurbanovo, Lucenec, Stropkov and Liesek. Filters from these monitors are analysed in the Institute of Public Health (Cs-137, Be-7).

On the base of bilateral agreement between the Austrian Ministry of Agriculture, Forestry, Environment and Water-Management and the Slovak Ministry of Environment Austrian side gave into the ownership of the Slovak side an automatic aerosol monitor AMS-02 including container and weather station. This monitor was installed in meteorological station Jaslovske Bohunice on 4-th October 2001. The Slovak Ministry of Environment provides the Austrian Ministry of Agriculture, Forestry, Environment and Water-Management with the readings of this monitor, free of charge, for at least 3 years and vice versa, the Austrian side gives the readings of the Austrian aerosol monitors to the Slovak Ministry of Environment free of charge. At present national monitoring center in Bratislava-Koliba is connected via ISDN line with Jaslovske Bohunice and Austrian center providing the data exchange.

Collecting of data

Radiation data (dose rate in the unit nSv/h) are collected via the Institute network to the MSS (message switch system) in the meteorological station Bratislava-Koliba (National Telecommunication Centre). The service program FTP-Watch runs on the server RADMON in SHMI and every 10 minutes the data from MSS are inserted into the database. The 2hour and 24hour averages are computed on the server automatically.

Radiation files from SHMI network are transmitted on-line to information system of Nuclear Regulatory Authority of the Slovak Republic and to Crisis Centre of Civil Defence.

Database

Two backedup servers work in the system of radiation monitoring under Windows 2000 Server operating system and MS SQL Server database system.

Database contains one table for radiation data and several tables for configurations, catalogues of stations and additional tables.

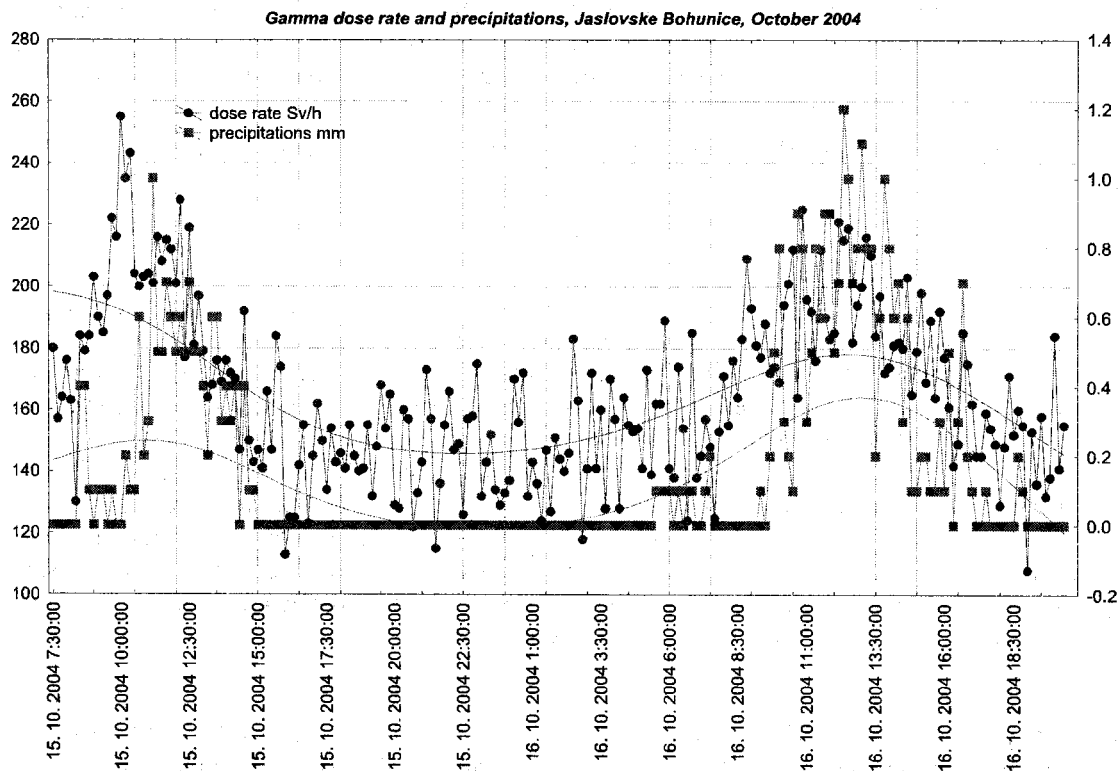
Database works in environment client-server. On client PC runs the user front-end application. This application provides to display the data using many filters, to display tables with configurations concerning technical equipment, to display maps, graphs, etc. There is the possibility to store data into the archives, to make reports.

This extensive database gives good opportunity to mathematical and statistical analysis. DTS (Data Transformation Services) as one part of SQL Server gives possibility to design reports in many formats based on SQL scripts.

Data Analysis

Time series from monitoring points are analysed by the environment of the statistical software STATISTICA 6.0. and presented in reports.

Precipitations values from meteorological stations were integrated do the information system of radiation monitoring for better interpretation of gamma dose rate values.



Cooperation in the Data Exchange on the national level

On the base resolution of government Commission for radiation accidents SHMI is operating Unit database of radiation data in the Slovak Republic. In the frame this database SHMI cooperates with other partners like: Slovak Army, Civil Defence, Ministry of Health, Slovak Power Plants. At present bilateral data exchange with Slovak Army, Ministry of Health, Slovak Power Plants and Civil Defence is running. Unit database is common platform for data processing, analysis, comparison and cooperation between partners. Experimental measurements in the Slovak radiation networks on 28 monitoring points was done in the last year.

International Data Exchange

European Commission Joint Research Centre Ispra

SHMI cooperates with European Commission Joint Research Centre (EC JRC) in Ispra in the frame EURDEP (European Union Data Exchange Platform) from 1999. At present we use in the data exchange with EC JRC new version of format EURDEP 2.0 from 1.12.2002. We send data from our monitoring network on ftp server of SHMI every 24 hour and then the data are downloaded to database in Ispra. We took part on all international emergency exercise with good results.

Austria

Data between SHMI and Radiation Warning Centre Vienna are exchanging by means of directories on the radiation monitoring server of SHMI. Every 10 minutes data from 336 Austrian stations are stored into the directory on our server and then inserted into the radiation database. Every 10 minutes data from our monitoring network are stored to the directory on server on our side and then downloaded to the Austrian side.

EURDEP format version 1.3 is used. We prepare the migration on platform EURDEP 2.0.

Hungary

On the base of agreement between Hungarian Ministry of Environment, Hungarian Ministry of Interior and the Slovak Ministry of Environment, SHMI started the data exchange with Hungary Meteoservices in summer 2002. Leased line Bratislava – Budapest of capacity 16 kbit/s was established. Data files with the radiation data in the EURDEP 2.0 format are exported from our database every 10 minutes and then files are downloaded to the server in Meteoservice Hungary. Files with radiation data are downloaded from Hungarian side each 1 hour (10 minutes averages).

In-situ measurements were done on all monitoring points SHMI in the cooperation with Hungarian National Directorate General for Disaster Management.

Data between SHMI and Meteoservices Hungary and SHMI and Radiation Warning Centre Vienna are transmitted via Regional Meteorological Data Communication Network (RMDCN).