REPORT ON SÚJB RESULTS ACHIEVED IN THE SURVEILLANCE OF NUCLEAR FACILITY SAFETY

AND RADIATION PROTECTION

FOR 2005

PART II

CONTENTS

1. RADIATION MONITORING IMPLEMENTED WITHIN THE RADIATION MONITORING NETWORK

This part of the submitted report summarizes the results obtained in radiation monitoring within the Czech Republic for 2005 and acquired by the countrywide Radiation Monitoring Network (RMS), and is thus related to the results obtained in monitoring presented in the Reports on Radiation situation within the Czech Republic from previous years (1995 – 2004). The report also gives brief information on RMS function and organization, and it is used as a basic document for monitoring and assessing the exposure of the public from the sources of ionizing radiation in the environment. For more detailed monitoring results see the Internet pages www.suro.cz.

1.1. Information on RMS Function and Organization

Legal framework for RMS operation is stipulated, together with relevant implementing regulations, in Act No. 18/1997 Coll., on the peaceful utilization of nuclear energy and ionizing radiation (hereinafter "Atomic Act"), as amended. The act outlines the particulars of RMS and appoints the institutions that participate in ensuring the operation. Besides SÚJB, i.e. its Regional Centres and the National Radiation Protection Institute, and the license holders permitted to operate nuclear facilities (ČEZ, a.s., and the Nuclear Research Institute Řež, a. s.), the Ministry of Finance, Ministry of Defence, Ministry of Interior, Ministry of Agriculture and Ministry of Environment are involved. Details as to RMS function and organization are governed by Decree No. 319/2002 Coll. (as amended by Decree No. 27/2006 Coll.). Other requirements for ensuring the monitoring of radiation situation are stipulated in the Government Regulation No. 11/1999 Coll. (for emergency planning zone), as well as the Monitoring Programs that, among others, determine the extent of monitoring the vicinity of nuclear facilities provided by license holders permitted to operate such facility. Particulars of the Monitoring Programs are laid down in Decree No. 307/2002 Coll., as amended, and they are approved by SÚJB. The operation of RMS is in accordance with the Atomic Act regulated by SÚJB.

In 2005, the monitoring of radiation situation within the Czech Republic in the normal mode was performed by the so-called permanent RMS components:

1. **An Early Warning Network (SVZ)** consisting of measuring point system performing continuous measuring of dose equivalent rate within the Czech Republic with current transfer of data to the center. A part of the system is the teledosimetric system situated in the premises and in the vicinity of NPP so that in case of radiation emergency situation or suspicion of such situation the escape to air and to streams is immediately registered and evaluated. The operation of SVZ is ensured by departments of SÚJB, Ministry of Environment (Czech Hydrometeorological Institute) and Ministry of Defence (Armed Forces of the Czech Republic) and ČEZ, a.s. (teledosimetric system).
2. **A Thermoluminescent Dosimetry Network (TLD),** which includes the system for measuring gamma-ray dose and consists of:
   - The so-called territorial TLD network operated by SÚJB department;
   - The so-called local TLD networks, i.e. measuring points in the vicinity of nuclear power plants operated by ČEZ, a.s. and SÚJB department.
3. **Measuring points of air contamination,** which include the means for measuring dose equivalent rate, and ensure aerosol and fallout sampling as well as determination of radionuclide activities in such samples; the operation of measuring points is ensured by

departments of SÚJB and Ministry of Environment (Czech Hydrometeorological Institute) and ČEZ, a.s.

4. **Measuring points of foodstuff contamination**, which include the means for sampling as well as determination of radionuclide activities in food-chain items. Operation of these measuring points is ensured by departments of SÚJB and Ministry of Agriculture (State Veterinary Institute in Prague, Czech Agricultural and Food Inspection Authority, Central Institute for Supervising and Testing in Agriculture, Forestry and Game Management Research Institute) and ČEZ, a.s.
5. **Measuring points of water contamination**, which include the means for sampling as well as determination of radionuclide activities in water, stream-laid sediments and in selected samples of aquatics. Operation of these measuring points is ensured by departments of SÚJB and Ministry of Environment (T. G. Masaryk Water Research Institute and Czech Hydrometeorological Institute) and ČEZ, a.s.
6. **Measuring points at the frontier crossings**, which include the means for acquiring data on radionuclide contamination of persons, transport means, goods, objects and materials at the frontier crossings. Operation of these measuring points is ensured by the Ministry of Finance department (Customs General Headquarters).
7. **Mobile groups**, which carry out monitoring of doses, dose equivalent rates and radionuclide activities in field, sampling of environmental components, and placement and replacement of dosimeters within the thermoluminescent dosimetry network. Operation of these measuring points is ensured by departments of SÚJB, Ministry of Finance (Customs General Headquarters) and Ministry of Interior (General Directorate of Fire Rescue Brigade of the Czech Republic and Police of the Czech Republic) and ČEZ, a.s.
8. **An Air Group**, which carries out monitoring of large areas (measuring of dose equivalent rates; surface or specific activities of artificial or natural radionuclides) and if required, it is ready to locate lost radiation source. It is ensured by SÚJB department (SÚRO) in cooperation with the Ministry of Defence (Armed Forces of the Czech Republic).
9. **Laboratory groups**, which ensure environmental sampling and carry out spectrometric or radiochemical analyses of environmental samples. Operation of such groups is ensured by SÚJB department (SÚRO and RC) and ČEZ, a.s.
10. **Monitoring Network Central Laboratory**, which coordinates measurements of samples taken by the laboratory and mobile groups. The Central Laboratory controls the selected measurements of these samples and evaluates the results with the aim of providing data to determine measures to be taken to reduce or prevent exposure to humans. In addition, the Laboratory coordinates and controls measurement of internal contamination of humans. Operation of this laboratory is ensured by SÚJB department (SÚRO).
11. **Meteorological service**, which acquires meteorological data necessary to perform evaluation and forecast of radiation situation development using the models for escaped radionuclides spreading in the air. Operation of this service is ensured by the Ministry of Environment department (Czech Hydrometeorological Institute).

The summary of samples taken within the framework of RMS monitoring from the environment and from the food-chain items, as well as numbers of such samples for 2005 are outlined in Table No. 1.

1.2. Monitoring of External Exposure

Monitoring of external exposure is ensured by SVZ, territorial and local TLD networks, and mobile and air groups.

1.2.1. Early Warning Network

Distribution of SVZ measuring points within the Czech Republic is shown on Figure No. 1. The measuring points are equipped with pairs of sensing elements ensuring continuous measuring of photon dose equivalent rate (mean dose rate per 10 minutes) in the range from 5.10^{-8} to 10^{0} Sv/hour. Acquired values are transferred to the central workplace at regular intervals (from 9 points situated in the measuring points of air contamination at RC SÚJB and SÚRO and from 7 measuring points situated at the workplaces of Fire Rescue Brigade every 10 minutes; from 38 measuring points located in the Czech Hydrometeorological Institute observatory in ordinary radiation situation every hour, in emergency radiation situation every 30 minutes). Furthermore, the Armed Forces of the Czech Republic ensures the measurement of dose equivalent rate on 11 measuring points in the form of single-shot measuring (in ordinary radiation situation twice a day, in emergency radiation situation as required by SÚJB Crisis Staff). Data is evaluated in the central database and in case of excess of reference levels (examination or intervention) the selected group of SÚRO and SÚJB Crisis Staff's personnel is automatically informed.

The operation mode of SVZ is centrally and locally controlled at individual stations by means of the program according to the decision scheme.

The results of all-year-round measuring of mean photon dose equivalent rates performed by sensing elements situated at RC SÚJB in Hradec Králové, Temelín NPP, Dukovany NPP and in Churáňov are shown on Figure Nos. 2a to 2d. The comparison of values shows evident influence of natural background at the measuring points located in different altitudes above sea level. The variations of photon dose equivalent rate (PFDE) during seasons in lower positions are at low figure and allow to determinate the examination levels for transition into the radiation emergency situation mode. Such levels are specific for the locality in question; however, they are season-independent (Figure Nos. 2a to 2c). The fluctuations of natural background in the stations located in higher positions (Figure No. 2d) are significant in the course of the year and the examination levels are determined taking into account meteorological (local) conditions in the season in question.

The values measured within the SVZ network corresponded to expected natural background variations and no excess of intervention levels was recorded in the year 2005. Total results of photon dose equivalent rate (PFDE) measuring within SVZ are available to the public all year round on the Internet page of SÚRO (www.suro.cz).

The values of tissue kerma rate (monthly mean values) measured by the SVZ department operated by the Armed Forces of the Czech Republic (AČR) are presented in Table No. 2.

The values of dose equivalent rate measured at one of the points (measuring point No. 13) of the TDS network operated by Dukovany NPP and the TDS network operated by Temelín NPP are illustrated on Figure No. 2e (Dukovany NPP TDS 2005 – measuring point No. 13) and Figure No. 2f (Temelín NPP TDS 2005 – measuring point No. 13).

In the course of the year 2005, there were no changes in the radiation situation within the state that could lead to the excess of intervention levels on the detectors of SVZ departments; if there was any excess of examination level, then it was due to rain precipitations in the relevant place. The responses of SVZ detector corresponding to calibration measurements performed, responses distorted by other factors, or influences – e.g. detector malfunctions, but not due to change in the radiation situation in the relevant place, were software-eliminated into time trends shown on Figure Nos. 2a to 2f.

1.2.2. TLD Networks

The area monitoring of the dose equivalent from external exposure is provided by TLD networks. The measuring is implemented in the form of integral measuring for 3 months; the interval is reduced, if required. The TLD network is comprised of 205 measuring points within the Czech Republic (territorial network); 9 measuring points thereof are located in the vicinity of Temelín NPP and 12 measuring points are located in the vicinity of Dukovany NPP (known as local networks). The operation of TLD network is ensured by SÚRO and RC SÚJB.

The dosimeters within TLD network are placed 1 meter above ground level (within the local network in the vicinity of Dukovany NPP they are placed 3 meters above ground level), in most cases (two thirds) in an open area. Part of the dosimeters is placed in buildings so that in case of radiation emergency the efficiency of population sheltering could be assessed. Distribution of the measuring points of TLD networks within the country is shown on map on Figure No. 3 (letter b indicates the points in buildings).

By means of TLD network, the value of photon dose equivalent rate or mean photon dose equivalent rate is determined thus providing sufficient basis for an estimate for effective dose.

The results of measurements acquired within the territorial TLD network for 2005 are presented in Table No. 3, which includes mean quarterly photon dose equivalent rate measured at individual measuring points.

No excess of examination levels was recorded in the year 2005. The several-year measurements within the TLD territorial network confirm its capability to record possible significant deviations from the normal state.

The results of measurements of external exposure acquired by SVZ and territorial TLD network in the year 2005 correspond to one another, as in previous years.

The results of measurements acquired by local networks in the vicinity of Dukovany and Temelín NPPs are indicated in Table Nos. 4 to 7.

The results of measurements in the local TLD networks operated by LRKO NPP are presented in Table Nos. 4 and 5 in the form of mean quarterly photon dose equivalent rate measured at individual measuring points.

1.2.3. Mobile Groups (MS)

Monitoring of radiation situation on determined routes is ensured by MS within the framework of TLD distribution and collection, when monitoring is performed on standard routes, and within the framework of emergency exercises, when monitoring is performed in accordance with the plan of exercise in question. There were two emergency exercises held in the year 2005, during which the operation of MS was practiced among other things and some results thereof are presented. The INEX-3 exercise (for details see Chapter No. 7.2.2) was involved, when each and every group was called to monitor radiation situation within the emergency preparedness zone (ZHP) in the vicinity of Dukovany NPP by means of measurement of dose equivalent rates on the run of automobile car (Figure No. 4). The exercise performed measuring of doses in case of "finding" or "capture" of ionizing radiation source (ZIZ), identified this source and suggested the measures to be taken for its security.

Six mobile groups of SÚJB department participated in the "PODZIM 2005" exercise on September 22 and 23, 2005, which was aimed at practicing the operation of single components of the Integrated Rescue System and RMS in the case of terrorist bomb attack with the possibility of using the CBRN – substances.

In the course of the year, the RC and SÚRO mobile groups performed drills for travelling measuring of dose equivalent rates at quarterly interval in collection and distribution of dosimeters within TLD networks. An example of results from fourth quarter of 2005 is illustrated on Figure No. 5.

1.2.4. Air Group (LeS)

Monitoring of radiation situation in the large area is ensured by the air group in the form of single flights over determined location, in particular within the framework of emergency exercises. In the course of "Havárie 2005" exercise, the air group (SÚRO in cooperation with the Armed Forces of the Czech Republic) carried out a training survey of surface contamination with gamma radionuclides in the year 2005. The area spreading between Náměští nad Oslavou and Moravský Krumlov was determined for "measuring" of surface contamination. Results of the measurement are shown on Figure No. 6. Individual measuring points are shown on the map in the form of dots, while their colour corresponds to interval, in which the measured dose equivalent rate occurs in the point in question.

1.3. Monitoring of Environmental Components

The Monitoring Network Central Laboratory, MMKO, MMKV and laboratory groups participate in monitoring of environmental components.

The following environmental components are monitored: air (aerosols, gases, fallouts), soils and stands, drinking and surface waters, water treatment sludge and stream-laid sediments.

1.3.1. Air

1.3.1.1. Aerosols

Aerosol monitoring is performed at selected MMKO. The map illustrating location of the individual facilities for sampling of atmospheric aerosol together with designation of the flow of used bleeding equipment is shown on Figure No. 7.

The time series of activity concentration of ^{137}Cs in aerosols taken from the air at MMKO in the year 2005, which was operated by RC SÚJB, SÚRO in Prague and Ostrava, and Czech Hydrometeorological Institute (Cheb, Holešov), are shown on Figure Nos. 8a to 8j. The time course of monthly mean values of activity concentration in aerosols at MMKO SÚRO in Prague after the accident in Chernobyl is shown on Figure No. 9.

In 2005, there were no significant deviations in the artificial radionuclide content in the air from long-term mean values. Detected tracks of ^{137}Cs came from the higher levels of the atmosphere and from the resuspension of the original fallout on the ground surface, and they amounted to tenths to ones of $\mu Bq/m^3$. A part of the ^{137}Cs activity in the air is from the global fallout from nuclear weapon tests in the atmosphere and another part from the

Chernobyl NPP accident. Figure No. 9 shows the long-term, currently very slow, decrease of the activity concentration of ^{137}Cs as well as seasonal variation of the content of ^{7}Be.

Besides the ^{137}Cs the ^{7}Be, which is of cosmogenic origin, and the ^{210}Pb, which is the product of the ^{222}Rn transformation, are evaluated in aerosols on a weekly basis. Monitoring of specific activities of such radionuclides is used for verification of result accuracy of the laboratory in question.

Table No. 8 shows the yearly mean values and tolerance intervals for relevant radionuclide activity concentration in the aerosols and current information is continuously presented on SÚRO homepage (http://www.suro.cz).

In aerosols, taken at MMKO SÚRO in Prague and in Hradec Králové, the activity concentration of ^{90}Sr was also determined in joint quarterly samples (Table No. 9). The activity of ^{238}Pu and $^{239,240}Pu$ was determined in joint quarterly samples from aerosols taken at MMKO SÚRO in Prague (Table No. 10).

1.3.1.2. Gases

Monitoring of ^{85}Kr has been included in the system of monitoring of the radionuclide content in the air performed by RMS in 1996, as part of the intention to include monitoring of all artificial radionuclides detectable in the environment. The activity of ^{85}Kr in the air comes from plants for nuclear fuel reprocessing, nuclear weapon tests in the atmosphere and, in small amounts, also from the effluents from nuclear power plants. It is one of the so-called global radionuclides, which contribute to worldwide uniform exposure of the population.

Sampling for determination of this nuclide is performed at MMKO SÚRO in Prague, and measuring is performed at the Radiation dosimetry department of the Nuclear Physics Institute of the Academy of Science of the Czech Republic. The time course of the activity concentration of ^{85}Kr in the air measure from 1986 up to the present is shown on Figure No. 10a. No significant changes in mean concentration activity were recorded over a period of last years.

In 2001, monitoring of ^{14}C in the atmosphere started. It involves the measurement of activity concentration of ^{14}C in the form of CO_2. Other possible forms of carbon in the air are not monitored since their concentrations are lower compared to CO_2 concentration (concentration of CH_4 and CO amounts usually to fractions of CO_2 concentration, and the values of concentration of other hydrocarbons are lower by several levels of magnitude). The activity of ^{14}C in the form of methane follows usually the time course of its activity in the form of CO_2. The carbon in the form of CO generally comes from fossil fuel combustion and the activity of ^{14}C is thus very low.

Current activity of ^{14}C in the air is particularly defined by its natural production in the higher atmospheric layers due to the action of cosmic radiation. The ^{14}C is also released in small amount to the air from nuclear facilities. The activity of ^{14}C in the air was increased due to nuclear weapon tests in the atmosphere. Such increase amounted to levels up to 80% above its natural occurrence in the middle of 1960s. Since then, the activity of ^{14}C lowers primarily under the action of deposition of the carbon in the ocean sediments and currently it does not exceed the natural value by more than 10%. Results of the measurement of ^{14}C in the form of CO_2 are shown on Figure No. 10b.

1.3.1.3. Fallouts

Measured values of fallouts also corroborated the fact that there were no significant deviations in the artificial radionuclide content in the air during the year 2005 (in the majority of measuring points, the values are below MVA). Likewise aerosols, including ^{137}Cs the ^{7}Be and ^{210}Pb, are evaluated in fallouts, monitoring of which is used for verification of correctness of results from the laboratory in question.

The monthly time series of the surface activity of ^{137}Cs in fallouts from the individual sampling points is shown on Figure Nos. 11a to 11h. The time series of the surface activity of ^{137}Cs, ^{7}Be and ^{210}Pb determined in fallouts collected on the water surface at MMKO SÚRO in Prague, again from the accident in Chernobyl, is shown on Figure No. 12a. The yearly mean values and tolerance intervals for the surface activity in the fallouts are indicated in Table No. 8. The activity concentration of ^{3}H in precipitations collected also at MMKO SÚRO in Prague is illustrated on Figure No. 12b.

1.3.2. Soils, Stand

No samples of soils and stands were taken in 2005 (this case does not involve monitoring of time series, but maintenance of corresponding methodical level). Four measurements were executed in the participation of all laboratory groups (LS), which perform measurement and evaluation of soil samples, in order to compare the methods for determination of artificial and natural radionuclide activities.

1.3.3. Drinking and Surface Waters

The monitoring point of water contamination monitored the activity of ^{137}Cs, ^{90}Sr and ^{3}H in the samples of drinking and surface water. Large sources of drinking water (Table No. 11) and selected surface waters (Table No. 12) were monitored in particular. The National Radiation Protection Institute in Prague, T. G. Masaryk Water Research Institute in Prague and Czech Hydrometeorological Institute participated in monitoring. The activity concentrations of ^{3}H in the samples from places not influenced by effluents from the nuclear facilities are low and about the same. The activity concentrations of ^{137}Cs and ^{90}Sr are very low at all monitored places.

The time course of the activity concentration of ^{3}H in selected streams is shown on Figure Nos. 13a to 13c. The ^{3}H content measured in the Vltava river in Hluboká, in the Jihlava river in Vladislav and in the Odra river is not influenced by the effluent from the nuclear power plant.

Within the framework of water quality monitoring, the Czech Hydrometeorological Institute ensures, in addition to other water quality parameters, determination of total activity concentration alpha, total activity concentration beta and total activity concentration beta after deducting the contribution of ^{40}K, concentration activity of ^{226}Ra, uranium concentration and tritium activity concentration in the samples from selected locations. Results of such determinations are published on the Internet page of the Czech Hydrometeorological Institute – www.chmu.cz.

1.3.4. Water Treatment Sludge, Stream-laid Sediments

Within the framework of monitoring point of water contamination activity ensured by the T. G. Masaryk Water Research Institute, the activity of ^{137}Cs (Table No. 13) was monitored in the stream-laid sediment and in the water treatment sludge in the vicinity of large sources of drinking water. The activity mass of ^{137}Cs in the water treatment sludge is low and about the same at all sampling points.

1.4. Monitoring of Food Chains

The Monitoring Network Central Laboratory, laboratory groups and monitoring point of foodstuff contamination ensured by the organizations of the Ministry of Agriculture and Ministry of Environment participate in monitoring of food chains.

The following samples are monitored: milk, meat, fish, wild-animal meat, potatoes, cereals, vegetable, fruit, honey, forest fruits, mushrooms and feedstuffs that are taken from both the distributors and from producers.

In order to maintain the time series from previous years, when monitoring was primarily ensured by the SÚJB department, this report includes separately, in addition to common results, the results from SÚJB department and from subjects outside the SÚJB department. In view of the type of data files, the range of detected values is provided with some commodities instead of mean value and tolerance interval. This involves in particular the cases when the activities were largely below the value of minimum significant activity (MVA) or when the presupposition on their monomodal lognormal distribution was not sufficiently fulfilled.

The minimum significant activities (MVA) for ^{137}Cs were below 0.1Bq/l in market-milk and below 0.1 Bq/kg in powdered milk when using concentration radiochemical methods. The activity concentrations in milk are the result of measurements of market-milk and powdered milk (taking into account concentration factor), since according to the monitoring plan the individual laboratories may use the plants producing powdered milk, according to local facilities, for sampling purposes.

The values of minimum significant activity (MVA) were generally lower than 0.5 Bq/kg in the case of slaughter meat as well as in the case of vegetable and fruit. The annual mean values and tolerance intervals for activity mass or concentration of ^{137}Cs in milk, meat, fruit, vegetable, honey, forest fruits and mushrooms for 2005 are indicated in Table Nos. 14a to 14c. The results of determination within the SÚJB department are shown in Table No. 14a, the results within the Ministry of Agriculture and Ministry of Environment departments are shown in Table No. 14b and the results from all subjects participating in this monitoring are included in Table No. 14c. The results of radiochemical determination of ^{90}Sr in the market-milk performed by SÚRO laboratories in Prague, Ostrava and Hradec Králové are presented in Table No. 15.

The values of activity mass of ^{137}Cs in forest fruits, mushrooms and wild animal meat against other foodstuffs are relatively higher and their decrease is very slow. Therefore, in spite of low consumption, the contribution to the total committed effective dose from ^{137}Cs ingestion is significant for an average citizen.

The results of activity mass determination of ^{137}Cs in cereals and in potatoes are indicated in Table Nos. 16a and 16b (Table No. 16a presents the results of SÚJB department, and Table No. 16b presents the results of the Ministry of Agriculture resort). The results of ^{90}Sr determination in the samples of wheat and barley performed in SÚRO in Prague are included in Table No. 17.

Time courses of annual mean activity mass or concentration of ^{137}Cs in milk, beef and pork are shown on Figure No. 14 in the way they were measured by the Radiation Monitoring

Network from 1986 to 2005 (only results from the SÚJB department are included to maintain continuation in time series).

Monitoring results of selected feedstuffs are included in Table No. 18.

1.5. Monitoring of Internal Contamination

As in previous years, the monitoring of ^{137}Cs internal contamination in persons' bodies continued on the SÚRO whole-body counter in Prague. The group of 29 persons (12 men, 17 women) participated in the monitoring in the year 2005, mainly Prague inhabitants in the age between 24 and 66 years. With respect to the very low content of ^{137}Cs in the population, the whole-body measurement is performed once a year only, while a long measurement period is used to reach the lowest limit of detectability. Based on these measurements, the mean activity of ^{137}Cs in the body of one person was estimated at 26 Bq in the year 2005.

The countrywide survey was performed as in previous years to ascertain the internal contamination of ^{137}Cs through the measurement of the ^{137}Cs activity excreted in urine in 24 hours. The samples were taken in May to June 2005 from 32 women and 27 men in total, who roughly represent the Czech population with their food habits. The mean value of the ^{137}Cs activity, excreted in urine in 24 hours, was 0.22 Bq and the recalculated mean content (retention) of ^{137}Cs activity in the body corresponding to it was 36 Bq.

The correspondence of mean activities in the body is very good considering the fact that two different groups of examined persons (in terms range as well as location) and different methods for this activity determination are concerned. Committed effective dose assessment based on results of the countrywide survey equals to 1.3 μSv for ^{137}Cs. Time retention course of ^{137}Cs with the Czech population acquired by measurement of the reference group and by measurement of the content of ^{137}Cs in urine since 1986 is illustrated on Figure No. 15.

The content of ^{137}Cs is monitored with the group of 12 persons (3 women, 9 men) from the North Moravia on a long-term basis, who consume, in an increased quantity, wild animal meat and forest fruits, in particular mushrooms. The mean value of the ^{137}Cs activity, excreted in urine in 24 hours, was 14.7 Bq with this group, which corresponds to the retention 2410 Bq and leads to an estimate of committed effective dose 95 μSv.

2. MONITORING OF NUCLEAR FACILITIES

2.1. Monitoring of Radionuclide Effluents from NPP

Radionuclide effluents from Dukovany NPP and Temelín NPP to the air and streams are limited by the so-called authorized limits laid down by SÚJB in decisions on allowance of the introduction of radionuclides into the environment. The authorized limits are expressed by summing up the annual effective dose from external exposure and the committed effective dose from internal exposure for individuals from critical group of population belonging to the exposure way in question. The adherence to the limits is proven by means of computer programs approved by SÚJB, i.e. for current radionuclide effluent to the air or to the stream in real meteorological or hydrological ratios in the year in question.

The authorized limit for effluents to the air is determined at 40 μSv at both nuclear power plants.

The authorized limit for effluents to the stream is determined at 6 μSv for Dukovany NPP and 3 μSv for Temelín NPP.

The limiting conditions for the operation of the nuclear reactor at Nuclear Research Institute in Řež are determined by the following maximum annual balance effluents of radionuclides to the vicinity of the Nuclear Research Institute:

For effluents to the air:

Radionuclide group	Reference radionuclide	Limit (Bq/r)
Tritium	^{3}H	1.10^{14}
Noble gases	^{41}A	1.10^{15}
Radioactive iodine	^{131}I	2.10^{10}
Beta aerosols	^{137}Cs	1.10^{10}
Alfa aerosols	^{239}Pu	7.10^{6}
Carbon	^{14}C	2.10^{12}

For effluents to the stream:

Radionuclide group	Reference radionuclide	Limit (Bq/r)
Tritium	^{3}H	2.10^{12}
Beta radiation sources	^{137}Cs	$2,2.10^{9}$
Alfa radiation sources with half-life period >5 years	^{239}Pu	4.10^{6}

2.1.1. Monitoring of Radionuclide Effluents from Dukovany NPP

2.1.1.1. Independent Monitoring

Within the independent monitoring of effluents from nuclear facilities to the air, SÚRO staff carried out air-mass sampling from the VK - 1 and VK - 2 ventilation stacks in 2005 at Dukovany NPP in order to determine the activity concentration of noble gases. During the sampling, the mass of air was sampled to pressure vessels and measured by semiconductor gamma spectrometry at SÚRO laboratories. After longer interval the activity of ^{85}Kr was determined in taken samples in like manner used for its activity concentration in the air. Results of the measurement are indicated in Table No. 19. The values from snap sampling are not contrary to measurements with monitors placed in the VK - 1 and VK - 2 ventilation stacks. The content of ^{14}C in the form of CO_2 and in the combustible forms has been monitored since 2002 in the snap air-mass sampling. The values of activity concentration of ^{14}C are indicated in Table No. 20. The activities of ^{90}Sr and transuranium radionuclides determined by SÚRO in the aerosol effluents of Dukovany NPP are indicated in Table No. 21.

The monthly values of tritium activity in the liquid effluents from Dukovany NPP measured by SÚJB and compared with the results of measuring performed by the Laboratory for Monitoring of Environment Radiation at Dukovany NPP are shown on Figure No. 16. The weekly values of tritium activity concentration in the liquid effluents in the discharge channel measured by SÚJB and measured by the Laboratory for Monitoring of Environment Radiation at Dukovany NPP are compared on Figure No. 17.

2.1.1.2. Monitoring of Effluents Ensured by Dukovany NPP

According to Dukovany NPP report "D57 - Radiation situation in the vicinity of Dukovany NPP for 2005", total radionuclide effluents from Dukovany NPP to the air amounted to 0.42% of annual limit, when the ^{14}C effluents represent the most part, which amounted to 0.39% of annual limit, and noble gases less than 0.03% of annual limit for effluents. Results of the measurement are indicated in Table No. 22.

Data of Dukovany NPP effluents to streams is indicated in Table No. 23. Total effluent to streams amounted to 30.70% of annual limit.

2.1.2. Monitoring of Radionuclide Effluents from Temelín NPP

2.1.2.1. Independent Monitoring

Within the "independent" monitoring there were three air-mass samplings from the internal HVB-1 ventilation stack, two air-mass samplings from the internal HVB-2 ventilation stack and one sampling from the BAPP ventilation stack performed in 2005 in order to determine the activity concentration of noble gases in the same manner as in case of Dukovany NPP. Results of the measurement are indicated in Table No. 24. The values from snap sampling are not contrary to snap measuring performed by NPP. The content of ^{14}C in the form of CO_2 and in the combustible forms has been monitored since 2002 in the snap air-mass sampling. The values of activity concentration of ^{14}C are indicated in Table No. 25. The activities of ^{90}Sr and transuranium radionuclides determined by SÚRO are indicated in Table No. 26.

The monthly values of tritium activity in the liquid effluents from Temelín NPP measured by SÚJB and compared with the results of measuring performed by the Laboratory for Monitoring of Environment Radiation at Temelín NPP are shown on Figure No. 18. The weekly values of tritium activity concentration in the liquid effluents in the discharge channel measured by SÚJB and measured by the Laboratory for Monitoring of Environment Radiation at Temelín NPP are compared on Figure No. 19.

2.1.2.2. Monitoring of Effluents Ensured by Temelín NPP

According to Temelín NPP report "D 02 – Results of effluent monitoring and radiation situation in the vicinity of Temelín NPP for 2005", total radionuclide effluents from Temelín NPP to the air amounted to less than 2.02% of annual limit expressed as maximum effective dose for individuals from the critical group of population. Results of the measurement are indicated in Table No. 27.

Balance measuring of radionuclide content in the liquid effluents demonstrates that less than 42.6% of annual authorized limit for liquid effluents was discharged in 2005. Data of Temelín NPP effluents to streams is indicated in Table No. 28.

2.1.3. Monitoring of Radionuclide Effluents from the Nuclear Research Institute in Řež

2.1.3.1. Independent Monitoring

In 2005, SÚRO performed one-shot evaluation of the activity concentration of radioactive noble gases in effluents from the ventilation stack at the Nuclear Research

Institute in Řež (LVR-15 reactor gaseous effluents fall thereto) in the same manner as at the nuclear power plant. Results of the determination are indicated in Table No. 29. The ^{41}Ar activity is dominant. Increase of concentration of this radionuclide in 2005, as compared to the preceding three years (Figure No. 20a), does not depart from long-term trends and represents still about 1/10 of authorized limits. The estimate of annual effluent of radionuclide noble gases carried out on the basis of SÚRO measurements is in good conformity with the values provided by the Nuclear Research Institute in Řež.

2.1.3.2. Monitoring Ensured by the Nuclear Research Institute in Řež

According to data provided by the Nuclear Research Institute in Řež, the ^{41}Ar effluent forms the most part of the effluents to the air, which amounted to 11.2% of annual limit in 2005. The annual activity values of noble gases in effluents to the air are shown on Figure No. 20a and the values of I-131 activity are shown on Figure No. 20b.

Radionuclide effluents to streams amounted to 0.28% of annual authorized limit in 2005. Summary of annual activity values of radionuclides discharged to streams (purifying station sampling) is shown on Figure No. 20c.

It is apparent from the summaries shown on Figure Nos. 20a to 20c that the values of radionuclide activities in gaseous and liquid effluents from the Nuclear Research Institute in Řež reach only a fraction of authorized limits for effluents.

2.2. Monitoring of the Vicinity of NPP

2.2.1. Dose Equivalent from External Exposure (Local TLD Networks)

Results of independent monitoring in the local TLD networks operated by SÚJB department are indicated in Table Nos. 6 and 7.

None of the networks registered any excess of examination levels in 2005. Lower values of photon dose equivalent rate (on an average, approximately by 30%) measured by the local LRKO network in the vicinity of Dukovany NPP, as well as in the preceding years, are related to the fact that the measuring performed at the same places is not involved and the difference in height of TL dosimeter placement becomes clearly evident. The LRKO dosimeters are installed 1m above the ground, while dosimeters of the SÚJB network are installed 3m above the ground.

2.2.2. Monitoring of Environmental Components and Food Chains in the Vicinity of NPP

Monitoring of environmental components and selected elements of the food chain in the vicinity of Dukovany and Temelín NPPs is carried out by the relevant RC SÚJB and by operators of nuclear power plants in accordance with their monitoring programs. Results of monitoring of the vicinity, possibly premises of NPP carried out by Dukovany NPP operator are shown on Figure No. 21a and in Table Nos. 30a and 31, and by Temelín NPP operator on Figure Nos. 21b and 21c and in Table Nos. 30b and 31. The time series of monitoring results of aerosols in the air in the premises and vicinity of both NPPs (Figure Nos. 21a to 21c) demonstrates that all values measured in 2005 were below the minimum significant activity (MVA). The tables show separately the activity concentration of ^{3}H in surface waters affected by effluents to streams from NPP: Table No. 30a includes samplings from the reservoir in Dalešice and from the sampling points located thereunder, Table No. 30b - from sampling point Vltava – Hladná, Vltava – Solenice and Vltava – Kořensko (check of possible back overflow). Both tables contain also the results from streams and wells, which could be affected by infiltrations and effluents of ^{3}H from NPP.

Figure No. 22 shows the results of independent monthly monitoring of tritium activity concentration performed by SÚJB in the profiles Mohelno of the Jihlava river, or Újezd of the Vltava river affected by tritium effluent from Dukovany NPP, or Temelín NPP.

Results of the independent monitoring of ^{137}Cs surface activity performed by SÚJB in fallouts in the vicinity of NPP are illustrated for two locations in the vicinity of Dukovany NPP on Figure No. 23 and for six locations in the vicinity of Temelín NPP on Figure No. 24.

Results of the independent monitoring ensured by the SÚJB resort are also included in Table Nos. 32a and 32b. The values of radionuclide activity mass in elements of the food chains range from hundredths to tenths of Bq/kg, as well as values detected in territorial monitoring.

Monitoring of the vicinity of Dukovany NPP and Temelín NPP proved that there are no differences between the radionuclide content in the individual environmental components and in food chains taken from the vicinity of nuclear power plants and from other parts of the country.

Results of the monitoring performed by SÚJB department, or other departments participating in RMS activity, are in good agreement with the results of monitoring ensured by NPP operators.

2.3. Evaluation of Consequences of the Accident at Chernobyl NPP

A part of the assessment of radiation situation within the Czech Republic in 2005 was the assessment of long-term consequences of the accident at Chernobyl NPP that primarily consists in monitoring of ^{137}Cs content in the air (aerosols and fallouts), in food chains and in human body with selected groups of population.

In 2005, the content of ^{137}Cs was, as in the preceding several years, with many samples under the detectable limit. Therefore, mean values and their tolerance intervals were assessed on the assumption that distribution of values in data files is a lognormal distribution. On occurrence of values under the detectable limit special statistical methods were employed making use of maximum credible estimates for censored data. The values of minimum significant activities (MVA) fluctuate also within the framework of time series of measuring performed by one laboratory. The influence of measurement length, used detector efficiency and sample size (e.g. sucked-air amount on aerosol sampling, bleeding equipment area for fallout collection, original volume of water, milk, etc., used for determination of activity of the radionuclide in question) is involved.

3. FINAL EVALUATION

Based on monitoring performed within the framework of RMS as well as monitoring performed in the vicinity of nuclear facilities, it may be stated that there was no escape of radionuclides to the environment registered in 2005 within the territory of the Czech Republic and that no excess of determined intervention levels was recorded at any of the measuring points that could result in the necessity of any population or environment protection measures. The variations in dose rate measuring are caused by fluctuations of natural background.

There is still measurable, very low activity of ^{137}Cs contained in the environmental components, food chains and in people that got into the environment after the Chernobyl accident. Its specific activity has remained almost the same, i.e. same as in longer interval from nuclear weapon tests in the atmosphere.

The effluents from Dukovany NPP remain very low. The radionuclide content in effluents to the air was about 0.42% of authorized annual limit; the content of tritium and activation, corrosion and fission products in effluents to streams equaled to 30.70% of authorized annual limit. However, the latter arises from nuclear power plant technology and it does not change significantly over years.

Total effluent of the individual radionuclides to the air from Temelín NPP for 2005 equaled to 2.02% of authorized annual limit; activities of tritium and activation, corrosion and fission products discharged from control tanks to streams were on the level of 42.60% of authorized annual limit.

The ^{41}Ar effluent forms the most part of the individual radionuclides to the air from the Nuclear Research Institute in Řež for 2005 - this effluent amounted to 11.2 % of annual limit, and effluent to streams amounted to 0.28% of annual limit.

There were no differences detected between the content of radionuclides in the individual environmental components from the vicinity of Dukovany and Temelín nuclear power plants compared to other parts of the country.

4. LIST OF ABBREVIATIONS USED IN THE REPORT

ARMS	Army Radiation Monitoring Network
AČR	Armed Forces of the Czech Republic
BAPP	Auxiliary Service Building for Primary Systems of Nuclear Power Plant
ČHMÚ	Czech Hydrometeorological Institute
EDU	ČEZ, a. s. - Dukovany Nuclear Power Plant (Dukovany NPP)
ETE	ČEZ, a. s. - Temelín Nuclear Power Plant (Temelín NPP)
GŘC	Customs General Headquarters
GŘ HZS ČR	General Directorate of Fire Rescue Brigade of the Czech Republic
HVB	(Main Production) Unit
HZS	Fire Rescue Brigade
IS RMS	Information System of Radiation Monitoring Network
JE	Nuclear Power Plant
JZ	Nuclear Facility
KŠ	Crisis Staff
LRKO	Laboratory for Monitoring of Environment Radiation
LeS	Air Group
LS	Laboratory Group
MDA	Minimum Detectable Activity
MF	Ministry of Finance of the Czech Republic
MM	Monitoring Point
MMKO	Monitoring Point of Air Contamination
MMKP	Monitoring Point of Foodstuff Contamination
MMKV	Monitoring Point of Water Contamination
MO	Ministry of Defence
MS	Mobile Group
MV	Ministry of Interior of the Czech Republic
MVA	Minimum Significant Activity
MZe	Ministry of Agriculture of the Czech Republic
MŽP	Ministry of Environment of the Czech Republic
ODZ	Radiation Dosimetry Department
PČR	Police of the Czech Republic
PDE resp. PFDE	Photon Dose Equivalent Rate
RC SÚJB	Regional Centre of the State Office for Nuclear Safety
RMS	Radiation Monitoring Network
SRKO	Environmental Radiation Control Station
SÚJCHBO	National Institute for Nuclear, Chemical and Biological Protection
SÚJB	State Office for Nuclear Safety
SÚRO	National Radiation Protection Institute
SVÚ	State Veterinary Institute
SVZ	Early Warning System
SZPI	Agricultural and Food Inspection Authority
TL	Thermoluminescent
TLD	Thermoluminescent Dosimetry
ÚJF AV ČR	Nuclear Physics Institute of the Academy of Science of the Czech Republic
ÚJV	Nuclear Research Institute Řež, a.s.

ÚKZÚZ	Central Institute for Supervising and Testing in Agriculture
VDMI	SÚJB Internal Documentation – teaching instruction
VK	Ventilation stack
VÚJE	Nuclear Power Plant Research Institute, a.s.
VÚLHM	Forestry and Game Management Research Institute
VÚV T.G.M.	T. G. Masaryk Water Research Institute
ZIZ	Ionizing Radiation Source

5. ANNEX NO. 1

6. ANNEX NO. 2

ANNEX NO. 1

Table No. 1 Summary of the number of samples analysed in the year 2005 within RMS

Table No. 2 Monthly mean values of the tissue kerma rate in the year 2005 (Measuring by the ARMS)

Table No. 3 Quarterly mean values of the photon dose equivalent rate measured by TLD territorial network in the Czech Republic in the year 2005 (measuring by the SÚRO)

Table No. 4 Quarterly mean values of the photon dose equivalent rate [nSv/h] measured by TLD local network in the vicinity of Dukovany NPP in the year 2005 (taken from the Dukovany NPP Report)

Table No. 5 Quarterly mean values of the photon dose equivalent rate [nSv/h] measured by TLD local network in the vicinity of Temelín NPP in the year 2005 (taken from the Temelín NPP Report)

Table No. 6 Quarterly mean values of the photon dose equivalent rate measured by TLD local network in the vicinity of Dukovany NPP in the year 2005 (measuring by the SÚRO)

Table No. 7 Quarterly mean values of the photon dose equivalent rate measured by TLD local network in the vicinity of Temelín NPP in the year 2005 (measuring by the SÚRO)

Table No. 8 Mean activity concentration of ^{137}Cs, ^{7}Be and ^{210}Pb [Bq/m^3] in the aerosols in the air and mean surface activity of ^{137}Cs, ^{7}Be and ^{210}Pb [Bq/m^2] in fallouts in the year 2005 (sampling and measuring by the RC SÚJB and SÚRO)

Table No. 9 Activity concentration [Bq/m^3] of ^{90}Sr in the air aerosol in the year 2005 (sampling and measuring by the SÚRO)

Table No. 10 Activity concentration [Bq/m^3] of ^{238}Pu and ^{239,240}Pu in the air aerosol in the year 2005 (sampling and measuring by the SÚRO)

Table No. 11 Activity concentration [Bq/m^3] of ^{3}H, ^{90}Sr and ^{137}Cs in selected drinking sources in the year 2005 (sampling and measuring by the SÚRO in Prague and VÚV TGM in Prague)

Table No. 12 Activity concentration [Bq/m^3] of ^{3}H, ^{90}Sr and ^{137}Cs in surface water in the year 2005 (sampling and measuring by the VÚV TGM in Prague)

Table No. 13 Activity mass values [Bq/kg] of ^{137}Cs in the water treatment sludge and stream-laid sediments in the year 2005 (sampling and measuring by the VÚV TGM)

Table No. 14a Activity mass [Bq/kg] and concentration [Bq/m^3] of ^{137}Cs in selected foodstuffs in the year 2005 (sampling and measuring by the RC SÚJB and SÚRO)

Table No. 14b Activity mass [Bq/kg] of ^{137}Cs in selected foodstuffs in the year 2005 (sampling by the SVÚ, SZPI and VÚLHM, measuring by the SVÚ)

Table No. 14c Activity mass [Bq/kg] and concentration [Bq/m^3] of ^{137}Cs in selected foodstuffs in the year 2005 (sampling by the RC SÚJB, SÚRO, SVÚ, SZPI and VÚLHM, measuring by the RC SÚJB, SÚRO and SVÚ)

Table No. 15 Activity concentration [Bq/m^3] of ^{90}Sr in milk in the year 2005 (sampling and measuring by the SÚRO in Hradec Králové, Ostrava and Prague)

Table No. 16a Activity mass [Bq/kg] of ^{137}Cs in cereals and in potatoes in the year 2005 (sampling and measuring by the RC SÚJB and SÚRO)

Table No. 16b Activity mass [Bq/kg] of ^{137}Cs in cereals and in potatoes in the year 2005 (sampling by the SZPI, measuring by the SVÚ)

Table No. 17 Activity mass [Bq/kg] of ^{90}Sr in cereals in the year 2005 (sampling and measuring by the SÚRO in Prague)

Table No. 1 Summary of the number of samples analysed in the year 2005 within RMS

Sample type	Total number of samples per year
Aerosols	522
Gases ($^{14}CO_2$, ^{85}Kr)	36
Fallouts	155
Soils	Samples measured within MS exercise
Drinking water	42
Surface water	60
Water treatment sludge	5
Stream-laid sediment	5
Milk	119
Meat	403
Wild-animal meat	87
Fish	44
Potatoes	11
Cereals	34
Vegetable	29
Fruits	26
Honey	13
Forest fruits	37
Mushrooms	75
Urines	71
Persons	28
Fodder grass	13
Silage	3
Feedstuffs	12
Fodder	42

Note:

Samples analysed within the independent monitoring of nuclear facilities are not included in the number of analysed samples.

Table No. 2 Monthly mean values of the tissue kerma rate in the year 2005 (measuring by the ARMS)

Measuring point	**101**	**102**	**201**	**202**	**204**	**205**	**207**
	[µGy/h]						
January	0.13	0.15	0.11	N	0.11	0.13	N
February	0.13	0.14	0.11	N	0.12	0.13	N
March	0.13	0.13	N	N	0.12	N	0.15
April	0.13	0.15	N	N	0.12	0.13	0.15
May	0.13	0.15	N	N	0.12	0.14	0.15
June	0.14	0.15	N	N	0.12	0.13	0.15
July	0.14	0.15	N	N	0.11	0.13	0.15
August	0.14	0.16	N	0.11	0.11	0.13	0.16
September	0.14	0.16	0.12	0.14	0.11	0.13	0.15
October	0.13	0.14	0.11	0.14	0.11	0.14	0.15
November	0.13	N	0.11	0.15	0.11	0.13	0.15
December	0.13	0.14	0.11	0.15	N	0.13	0.14

Measuring point	**208**	**209**	**210**	**301**	**302**	**303**	**401**
	[µGy/h]						
January	0.14	N	N	0.13	0.15	0.13	N
February	0.14	N	N	0.13	0.15	0.13	0.14
March	0.14	N	N	0.14	0.15	0.13	0.14
April	0.14	N	N	0.14	0.15	0.13	0.16
May	0.14	N	N	0.14	0.15	0.13	0.17
June	0.14	N	N	0.14	N	0.13	0.16
July	N	N	N	0.15	0.15	0.14	0.16
August	0.14	N	0.14	0.15	N	0.13	0.15
September	N	N	0.15	0.16	N	0.10	0.14
October	0.11	0.12	0.15	0.16	N	0.10	0.14
November	N	0.13	0.15	0.17	0.14	0.10	0.14
December	0.11	0.13	0.15	0.16	0.15	0.10	0.14

Note:

N – not measured due to measuring instrument failure

Table No. 3 Quarterly mean values of the photon dose equivalent rate measured by TLD territorial network in the year 2005 (measuring by the SÚRO - transport of dosimeters from/to measuring points by relevant RC SÚJB)

Measuring point	I/05	II/05	III/05	IV/05	Mean value
	nSv/h				
Benešov	121	122	120	126	**122**
Benešov b	116	103	108	111	**110**
Beroun	118	123	125	126	**123**
Beroun b	115	107	120	120	**115**
Blansko	115	100	99	98	**103**
Blatná	145	145	153	140	**146**
Brandýs nad Labem	83	86	97	95	**90**
Brno	117	126		111	**118**
Brno b	136	121	110	117	**121**
Broumov	134	126	126	118	**126**
Bruntál	118	129	107	109	**116**
Červena Voda	126	140	139	140	**136**
Červena Voda b	208	201	178	206	**198**
Česká Lípa	107	115	101	107	**107**
Česká Lípa b	117	117	103	110	**112**
České Budějovice	136	137	133	123	**132**
České Budějovice b	161	151	152	148	**153**
Český Krumlov	155	139	147	130	**143**
Český Krumlov b	151	146	151	150	**150**
Děčín	79	101	80	79	**85**
Dobrá Voda	128	132	141	120	**130**
Doksy	90	104	96	88	**95**
Domažlice	92	121	104	99	**104**
Domažlice b	140	155	148	153	**149**
Frýdlant nad Ostravicí	78	89	86	88	**85**
Havlíčkův Brod	132	129	139	125	**131**
Havlíčkův Brod b	142	131	136	135	**136**
Hodonín	93	85	85	80	**86**
Hodonín b	149	128	123	122	**131**
Hojsova Stráž	95	136	135	119	**121**
Hradec Kralové	104	103	99	105	**103**
Hradec Kralové b	124	108	104	111	**112**
Hradec Kralové-SVZ	115	104	104	110	**108**
Hranice	103	109	89	103	**101**
Humpolec	141	138	147	126	**138**
Husinec	116	110	121	121	**117**
Cheb	75	95	88	88	**86**
Chrudim	125	120	126	119	**123**
Churáňov	88	142	139	118	**122**

Contd. Table No. 3 **Quarterly mean values of the photon dose equivalent rate measured by TLD territorial network in the year 2005** (measuring by the SÚRO - transport of dosimeters from/to measuring points by relevant RC SÚJB)

Measuring point	I/05	II/05	III/05	IV/05	Mean value
	nSv/h				
Ivančice	105	121	116	113	**114**
Jaroměřice nad Rokytnou	149	153	141	138	**146**
Jeseník	90	88	84	78	**85**
Jeseník b	134	126	124	122	**127**
Jičín	121	120	124	127	**123**
Jihlava	109	115	100	110	**108**
Jihlava b	167	152	145	148	**153**
Jindřichův Hradec	120	130	133	128	**128**
Jindřichův Hradec b	127	133	138	133	**132**
Karlovy Vary	101	126	132	122	**120**
Karlovy Vary b	81	99	81	95	**89**
Kladno	140	133	140	140	**138**
Klatovy	103	131	120	114	**117**
Klatovy b	141	143	140	143	**142**
Kolín	102	100	102	103	**102**
Koryčany	116	110	105	104	**109**
Košetice	130	133	126	116	**126**
Košetice b	110	107	106	98	**105**
Kralovice	82	113	103	97	**99**
Kraslice	94	148	134	117	**123**
Kroměříž	104	100	93	98	**99**
Kutná Hora *)				99	**99**
Kutná Hora b	131	123	122	126	**125**
Liberec	130			163	**146**
Liberec b	171	165	144	173	**164**
Litoměřice	95	104	100	92	**98**
Litoměřice b	121	119	115	118	**118**
Louny	109	116	103	111	**110**
Mariánské Lázně	100	125	104	103	**108**
Mariánské Lázně b	135	138	93	92	**114**
Měděnec	84	111	98	88	**95**
Mělník	100	101	100	108	**102**
Mělník b	127	120	120	127	**124**
Mikulov	105	112	96	87	**100**
Milevsko	167	166	179	171	**171**
Milevsko b	169	152	145	132	**149**
Mladá Boleslav	104	97	102	99	**101**
Mladá Boleslav b	104	96	98	102	**100**

Contd. Table No. 3 Quarterly mean values of the photon dose equivalent rate measured by TLD territorial network in the year 2005 (measuring by the SÚRO - transport of dosimeters from/to measuring points by relevant RC SÚJB)

Measuring point	I/05	II/05	III/05	IV/05	Mean value
	nSv/h				
Mníšek pod Brdy	116	125	112	123	**119**
Most	104		102	103	**103**
Most b	108	105	102	104	**105**
Náchod	110	116	112	104	**111**
Náchod b	105	107	106	110	**107**
Nepomuk	147	161	164	157	**157**
Nová Bystřice	126	145	148	132	**138**
Nová Říše	125	123	127	122	**124**
Nová Ves v Horách	86	124	108	100	**105**
Nové Město pod Smrkem	90	125	93	106	**104**
Nový Jičín	96	107	86	90	**95**
Nymburk	93	92	93	99	**94**
Nymburk b	118	113	118	122	**118**
Odry b	123	111	103	105	**111**
Olešník	123		132	123	**126**
Olomouc	101	98	83	95	**94**
Olomouc b	130	112	99	112	**113**
Opava	100	96	91	91	**95**
Opava b	125	112	104	110	**113**
Opočno	96	112	106	107	**105**
Osoblaha	122	112	112	110	**114**
Ostrava - Poruba hospital	107	106	109	106	**107**
Ostrava - Syllabova	107	98	95	98	**100**
Ostrava - Syllabova b	128	119	112	119	**119**
P 1 - SÚJB - SVZ	104	95	100	106	**101**
P 1 - SÚJB b	125	120	120	129	**124**
P10 - Hostivař	132	124	141	133	**133**
P10 - SÚRO - SVZ	101	99	104	108	**103**
P10 - SÚRO b - reference	127	117	119	120	**121**
P4 - Libuš - západ	115	103	108	108	**108**
P4 - Libuš - západ b	99	106	112	110	**107**
P5 - Na Černém vrchu	119	115	121	126	**120**
P5 - Na Černém vrchu b	135	125	132	133	**132**
P6 - Ruzyně - Airport	104	102	103	109	**105**
P7 - Zoologická zahrada	99	103	103	108	**103**
P8 - Za střelnicí	130	122	126	128	**126**
P8 - Za střelnicí b	142	129	133	132	**134**
Pardubice	99	112	116	115	**110**

Contd. Table No. 3 Quarterly mean values of the photon dose equivalent rate measured by TLD territorial network in the year 2005 (measuring by the SÚRO - transport of dosimeters from/to measuring points by relevant RC SÚJB)

Measuring point	I/05	II/05	III/05	IV/05	Mean value
	nSv/h				
Pec pod Snežkou	79	133	120	118	**113**
Pec pod Snežkou b	143	126	125	127	**130**
Pelhřimov	186	156	159	155	**164**
Pelhřimov b	203	173	190	180	**187**
Písek	148	145	145	130	**142**
Písek b	164	151	155	144	**154**
Plzeň	103	109	104		**105**
Plzeň - SVZ	105	122	110	109	**111**
Plzeň b	129	137	121	126	**128**
Prachatice		128	131	120	**126**
Prachatice b	145	117	130	124	**129**
Prostějov	112	107	99	100	**105**
Přerov	79	112	99	106	**99**
Příbram	121	123	127	130	**125**
Příbram b	186	179	178	186	**182**
Přimda	105	134	119	110	**117**
Přimda b	146	157	140	147	**148**
Rakovník	200	205	207	223	**208**
Rakovník b	227	229	234	227	**229**
Rychnov nad Kněžnou	115	107	107	111	**110**
Řež	104	105	103	109	**105**
Sedlčany	189	202	191	205	**197**
Semily	91	103	105	102	**100**
Soběslav	110	102	102	97	**103**
Souš	63	134	125	106	**107**
Staňkov	106	115	108	115	**111**
Staňkovice	127	135	136	136	**134**
Strakonice	130	134	138		**134**
Strakonice b	154	131	137	126	**137**
Strání	95	98	95	93	**95**
Stříbro	98	119	107	103	**107**
Stříbro b	138	134	122	127	**130**
Svitavy	120	116	119	118	**118**
Šluknov	88	102	100	97	**97**
Šumperk	82	104	97	100	**96**
Tábor	166	175	174	165	**170**
Tábor b		156	148	145	**149**
Temelín	119	132	134	115	**125**

Contd. Table No. 3 Quarterly mean values of the photon dose equivalent rate measured by TLD territorial network in the year 2005 (measuring by the SÚRO - transport of dosimeters from/to measuring points by relevant RC SÚJB)

Monitoring point	**I/05**	**II/05**	**III/05**	**IV/05**	**Mean value**
	nSv/h				
Teplice	147	160	150	157	**153**
Trutnov	107	142	127	120	**124**
Třebíč	169	156	171	160	**164**
Třinec	78	88	92	81	**85**
Uherské Hradiště	114	100	93	99	**101**
Uničov	106	113	106	110	**109**
Ustí nad Labem - Habrovice	78	75	80	79	**78**
Ustí nad Labem - Habrovice b	160	124	126	130	**135**
Ustí nad Labem - Kočkov	95	96	106	130	**107**
Ustí nad Labem - Střekov	87	89	84	83	**86**
Ústí nad Orlicí	118	124	119	117	**120**
Vír	130	128	135	124	**129**
Vítkov	125	127	120	122	**123**
Vlašim *)	106	111	110	111	**110**
Volary	112	123	132	118	**121**
Vranov nad Dyjí	111	101	97	95	**101**
Vsetín	90	100	101	100	**98**
Vyškov	120	118	110	116	**116**
Vyšší Brod	194	190		152	**178**
Zákřany	131	133	123	130	**129**
Zbiroh	93	109	102	107	**103**
Zbiroh b	122	120	116	107	**116**
Zlín	130	94	89	88	**100**
Zlín b	102	110	105	108	**106**
Znojmo	130	120		123	**124**
Znojmo b	149	118	120	129	**129**
Žatec	103	119	98	103	**106**
Žatec b	156	132	130	135	**138**
Žďár nad Sázavou	105	123	115	113	**114**
Žlutice	96	107	101	96	**100**
Žlutice b	168	167	153	161	**162**

Notes:
If the result is not provided, the dosimeter was stolen or damaged in the relevant location.
Letter “b” after the name of measuring point indicates placement of the dosimeter inside the building.
Sign “*” indicates displacement of the measuring point within the location in the relevant year.

Table No. 4 Quarterly mean values of the photon dose equivalent rate measured by TLD local network in the vicinity of Dukovany NPP in the year 2005 (measuring by the LRKO Moravský Krumlov, taken from the Dukovany NPP Report)

Measuring point	**I/05**	**II/05**	**III/05**	**IV/05**	**Mean value**
	nSv/h				
Biskupice	94	76	94	97	**90**
Březník	90	90	79	115	**94**
Čučice	94	72	79	97	**86**
Dalešice	79	90	76	119	**91**
Dolní Dubňany	65	50	54	68	**59**
Dukovanský mlýn	50	47	43	65	**51**
Dukovany	94	68	83	94	**85**
Hartvíkovice	101	86	97	115	**100**
Hrotovice	119	119	112	140	**123**
Hrotovice - Stínský rybník	72	54	58	65	**62**
Hrubšice	97	79	83	104	**91**
Ivančice	79	72	68	97	**79**
Jaroměřice nad Rok.	94	83	86	140	**101**
Jevišovice	104	104	104	104	**104**
Kordula	86	90	79	115	**93**
Kordula - grass-land	43	32	32	43	**38**
Lipňany - plain	47	47	40	54	**47**
Mikulovice	72	68	65	94	**75**
Mohelno	43	40	40	58	**45**
Mohelno - Horákův buk	58	65	58	83	**66**
Moravský Krumlov	97	61	79	83	**80**
Myslibořice	115	108	104	133	**115**
Náměšť n. Oslavou	79	68	76	94	**79**
Oslavany	101	76	83	104	**91**
Rouchovany	72	61	72	83	**72**
Skryjský mlýn	54	43	54	65	**54**
Slavětice	83	65	68	86	**76**
Tavíkovice	86	61	79	86	**78**
Trstěnice	79	65	68	94	**77**
Třebíč	144	119	133	151	**137**
Udeřice	90	90	79	112	**93**
Valeč	94	65	86	90	**84**
Vémyslice	104	83	86	108	**95**
Višňové	86	68	76	90	**80**
Vranov nad Dyjí	86	72	76	97	**83**
Znojmo	72	72	61	90	**74**

Note:
The measuring points are placed 3 m above the ground.

Table No. 5 Quarterly mean values of the photon dose equivalent rate measured by TLD local network in the vicinity of Temelín NPP in the year 2005 (measuring by the LRKO in České Budějovice, taken from the Temelín NPP Report)

Measuring point	**I/05**	**II/05**	**III/05**	**IV/05**	**Mean value**
	nSv/h				
Býšov - ČEZ premises		116	123	123	**121**
Býšov - forester's house Strouha	113	121	123	127	**121**
Coufalka	116	127	130	133	**127**
Coufalka - forester's house	122	126	133	127	**127**
Červený Vrch	120	128	130	132	**128**
Dříteň - No. 116	135	132	129	129	**131**
Hněvkovice - ISOŠ	117	119	130	125	**123**
Hněvkovice - dam	117	128	127	134	**127**
Hůrka - soil sanitation	119	123	126	131	**125**
Kočín - No. 8	120	128	127	129	**126**
Lhota pod Horami - No. 27	144	178	147	162	**158**
Lhota pod Horami - cowshed	121	127	130	131	**127**
Lhota p. Horami- gasworks station	120	129	131	135	**129**
Litoradlice, No. 10	115	118	123	126	**121**
Malešice - No. 36	118	123	124	125	**123**
Malešice - farm	108	113	114	115	**113**
Neznašov	156	170	-	177	**168**
Nová Ves, No.2	124	129	134	136	**131**
Planovy - No. 38	131	144	131	144	**138**
Předhájek - Všemyslice	161	162	164	161	**162**
SRKO Bohunice	110	99	115	92	**104**
SRKO ČEZ-Temelín NPP	121	118	122	125	**122**
SKRO Litoradlice	122	124	131	129	**127**
SRKO Nová Ves	130	142	141	144	**139**
SRKO Sedlec	97	98	-	95	**97**
SRKO Zvěrkovice	119	125	131	130	**126**
Strachovice	114	106	86	112	**105**
Temelín - meteorolog. station	118	128	110	102	**115**
Temelín - at outpatient clinic	125	130	132	115	**126**
Týn n. Vltavou – kindergarten	127	135	133	137	**133**
Týn n. Vltavou – water level	120	127	128	126	**125**
U palečků	117	120	127	131	**124**
Všemyslice - No. 33	122	123	-	133	**126**
Záluží	123	131	131	136	**130**

Note:
If the result is not provided, the dosimeter was stolen or damaged in the relevant location.

Table No.6 Quarterly mean values of the photon dose equivalent rate measured by TLD local network in the vicinity of Dukovany NPP in the year 2005 (measuring by the SÚRO – transport of dosimeters from/to measuring points by RC in Brno)

Measuring point	I/05	II/05	III/05	IV/05	Mean value
	nSv/h				
Biskupice	107	106	107	107	**107**
Dukovany	111	111	105	102	**107**
Hartvíkovice	133	135	142	137	**137**
Mohelno	109	107	111	112	**110**
Moravský Krumlov	116	118	119	116	**117**
Náměšť nad Oslavou	116	123	119	122	**120**
Resice	125	120	121	123	**122**
Rouchovany	113	-	105	110	**109**
Skryje	71	71	70	67	**70**
Slavětice	103	112	-	118	**111**
Višňové	110	118	120	113	**115**
Vladislav	144	152	160	161	**154**

Notes:
If the result is not provided, the dosimeter was stolen or damaged in the relevant location.

Table No. 7 Quarterly mean values of the photon dose equivalent rate measured by TLD local network in the vicinity of Temelín NPP in the year 2005 (measuring by the SÚRO – transport of dosimeters from/to measuring points by RC in České Budějovice)

Measuring point	I/05	II/05	III/05	IV/05	Mean value
	nSv/h				
Dívčice	137	133	132	133	**134**
Litoradlice	113	109	115	108	**111**
Mydlovary	139	140	147	142	**142**
Protivín	145	139	145	141	**143**
Radonice	120	112	124	110	**116**
Ševětín	122	122	130	121	**123**
Týn nad Vltavou	125	120	127	115	**122**
Vodňany	131	129	135	135	**133**
Zliv	137	132			**135**

Note:
If the result is not provided, the dosimeter was stolen or damaged in the relevant location.

Table No. 8 Mean activity concentration of ^{137}Cs, ^{7}Be and ^{210}Pb in the aerosols in the air [Bq/m^3] and mean surface activity of ^{137}Cs, ^{7}Be and ^{210}Pb in fallouts [Bq/m^2] in the year 2005 (sampling and measuring by the RC SÚJB and SÚRO)

Component	**Mean value *)** (arithmetic mean)	**95% tolerance interval**			**Number of measurements**	
					Total	**> MVA**
^{137}Cs						
Aerosols	8.9E-07	3.1E-08	-	5.4E-06	522	277
Fallouts	4.2E-02	8.6E-04	-	3.7E-01	93	30
^{7}Be						
Aerosols	3.2E-03	5.9E-04	-	1.1E-02	522	521
Fallouts	7.3E+01	2.0E-01	-	8.4E+02	93	83
^{210}Pb						
Aerosols	4.4E-04	6.1E-05	-	1.7E-03	489	469
Fallouts	9.1E+00	2.2E-02	-	1.2E+02	82	43

Note:
95% tolerance interval – interval, during which 95% of values of monitored quantity is expected.
MVA indicates the minimum significant activity for reliability level 95%.
*) The sampling point at SÚRO in Prague was chosen to the mean values for fallouts for the location in Prague and the sampling point ČB U nemocnice for the location of RC in České Budějovice.

Table No. 9 Activity concentration of ^{90}Sr in the air aerosol in the year 2005 (sampling by the SÚRO in Hradec Králové and Prague, measuring by the SÚRO in Prague)

Sampling point	**Quarter**	**Activity [Bq/m^3]**
Prague	1	<1.6E-07
	2	<1.5E-06
	3	1.3E-07
	4	<1.3E-07
Hradec Králové	1	8.0E-08
	2	<4.2E-07
	3	1.1E-07
	4	<6.2E-08

Notes:
Activity determined from joint weekly samples in the relevant quarter.
Sign “<” – minimum significant activity for reliability level 95%.

Table No. 10 Activity concentration of ^{238}Pu and $^{239,240}Pu$ in the air aerosol in the year 2005 (sampling and measuring by the SÚRO)

Year	Quarter	^{238}Pu Activity [Bq / m³]	$^{239,240}Pu$ Activity [Bq / m³]
2001	1	2.1E-10	1.5E-09
	2	4.3E-10	1.49E-09
	3	< 2.1E-10	1.31E-09
	4	2.8E-10	1.6E-09
2002	1	< 2.1E-10	8.2E-10
	2	8.1E-10	2.15E-08
	3	1.78E-09	4.59E-08
	4	6.2E-10	5.06E-09
2003	1	< 5.2E-10	2.28E-09
	2	2E-10	4.06E-09
	3	3.1E-10	3.97E-09
	4	2.5E-10	2.5E-09
2004	1	< 7.4E-10	3.22E-09
	2	< 1.1E-9	< 1.1E-09
	3	< 6.5E-10	1.23E-09
	4	3.2E-10	3.02E-09
2005	1	<3.1E-10	8.60E-10
	2	<4.0E-10	2.52E-09
	3	<1.7E-10	2.15E-09
	4	<3.5E-10	1.56E-09

Note:
Activity determined from joint weekly samples in the relevant quarter.
Sign "<" – minimum significant activity for reliability level 95%.

Table No. 11 Activity concentration of ^{3}H, ^{90}Sr and ^{137}Cs in selected drinking sources in the year 2005 (sampling and measuring by the SÚRO in Prague and VÚV TGM in Prague*)

Sampling point	Activity concentration [Bq/l]					
	^{3}H				^{137}Cs	^{90}Sr
	1st quarter	2nd quarter	3rd quarter	4th quarter	Year	Year
Káraný (Jizera)	1.1	1.0	1.0	1.4	< 3.3E-04	1.9E-03
Jesenice (Želivka)	1.4	1.1	1.2	2.0	< 2.1E-04	3.8E-03
Kružberk (Odra)	1.2	1.3	< 0.6	1.4	< 3.0E-04	< 2.0E-03
Fláje (Ohře)	0.7	1.3	1.3	1.7	2.0E-03	< 2.0E-03
Křižanovice (Labe)	< 0.6	1.5	1.5	1.4	< 3.0E-04	< 2.5E-03

Contd. Table No. 11 Activity concentration of ^{3}H, ^{90}Sr and ^{137}Cs in selected drinking sources in the year 2005

Sampling point	Activity concentration [Bq/l]					
	^{3}H				^{137}Cs	^{90}Sr
	1st quarter	2nd quarter	3rd quarter	4th quarter	Year	Year
Vír (Morava)	1.6	1.3	0.9	< 0.7	< 3.0E-04	3.9E-03
Římov (Vltava)	< 0.6	1.4	0.8	2.4	5.0E-04	5.1E-03

Note:
*) Samplings and pre-treatment of samples for analyses performed by VÚV TGM ensured Povodí, s.p.
Sign "<" – minimum significant activity for reliability level 95%.

Table No. 12 Activity concentration of ^{3}H, ^{90}Sr and ^{137}Cs in surface water in the year 2005 (sampling and measuring by the VÚV TGM in Prague*)

Basin - profile	Activity concentration [Bq/l]					
	^{3}H				^{137}Cs	^{90}Sr
	1st quarter	2nd quarter	3rd quarter	4th quarter	Year	Year
Odra - Bohumín	1.1	1.7	1.7	1.8	< 4.0E-04	< 2.0E-3
Odra - Kružberk (Moravice)	1.7	< 0.6	1.3	1.2	< 3.0E-04	3.1E-03
Ohře - Fláje (Flájský potok)	< 0.6	1.3	1.4	1.6	1.6E-03	< 2.0E-03
Ohře - Přísečnice (Přísečnický potok)	2.1	< 0.6	2.0	1.4	< 3.0E-04	< 2.6E-03
Labe - Hřensko	3.0	3.6	4.1	6.8	5.0E-04	< 2.0E-03
Labe - Křižanovice (Chrudimka)	< 0.6	1.1	2.3	1.5	5.0E-04	< 2.3E-03
Morava - Moravský Svatý Ján	10.3	7.7	11.9	15.5	5.0E-04	4.0E-03
Morava - Vír (Svratka)	1.4	1.7	0.7	< 0.7	4.0E-04	3.4E-03
Vltava - Švihov (Želivka)	1.7	0.9	0.6	0.9	< 5.0E-04	< 2.0E-03
Vltava - Římov (Malše)	1.2	0.7	1.0	1.7	6.0E-04	6.0E-03

Notes:
*) Samplings and pre-treatment of samples for analyses performed by VÚV TGM ensured Povodí, s.p.
Sign "<" – minimum significant activity for reliability level 95%.

Table No. 13 Activity mass values of ^{137}Cs in the water treatment sludge and stream-laid sediments in the year 2005 (sampling and measuring by the VÚV TGM in Prague)

Basin - profile	Water treatment sludge	Stream-laid sediments
	[Bq / kg of dry matter]	
Odra - Kružberk (Moravice)	9	3
Ohře - Fláje (Flájský potok)	26	84
Labe - Křižanovice (Chrudimka)	11	8
Morava - Vír (Svratka)	10	44
Vltava - Římov (Malše)	8	116

Table No. 14a Activity mass and concentration of ^{137}Cs in selected foodstuffs in the year 2005 (sampling and measuring by the RC SÚJB and SÚRO)

Component	Unit	Range of measured values *)			Number of measurements	
					Total	> MVA
Milk	Bq/l	< 5.0E-03	-	9.3E-01	99	87
Beef	Bq/kg	< 4.0E-02	-	1.3E+00	100	51
Pork	Bq/kg	< 3.1E-02	-	1.7E-01	29	11
Poultry	Bq/kg	< 5.6E-02	-	2.8E-01	28	11
Other meat	Bq/kg	< 3.5E-02	-	1.4E-01	12	3
Wild-animal meat	Bq/kg	1.2E+00	-	1.3E+03	3	3
Fish	Bq/kg	< 3.8E-02	-	3.3E-01	5	4
Fruits	Bq/kg	< 1.1E-02	-	4.2E-02 **)	20	2
Vegetable	Bq/kg	< 9.9E-03	-	1.7E-01 **)	21	3
Forest fruits	Bq/kg	< 2.1E-02	-	8.5E+01	16	12
Mushrooms	Bq/kg	< 2.4E-01	-	1.3E+03	24	23

Notes:
MVA - minimum significant activity for reliability level 95%.
Sign "<" – minimum significant activity for reliability level 95%.
*) With regard to data file properties, the range of measured values is used as data file characteristics; in the event that the file contains some values below MVA, the lowest MVA value is indicated; in the event that there was no value detected above MVA, the range of MVA values is indicated.
**) The highest value MVA 2.3E-01 Bq/kg was determined in the "Fruits" commodity, which is higher than maximum determined activity, and the highest value MVA 3.6E-01 Bq/kg was determined in the "Vegetable" commodity, which is higher than maximum determined activity.

Table No. 14b Activity mass of ^{137}Cs in selected foodstuffs in the year 2005 (sampling by the SVÚ, SZPI, VÚLHM and VÚV T.G.M., measuring by the SVÚ and VÚV T.G.M)

Component	Unit	Range of measured values *)			Number of measurements	
					Total	> MVA
Powdered milk	Bq/kg	< 5.0E-02	-	8.2E-01	20	15
Beef	Bq/kg	< 4.5E-02	-	4.0E+00	91	43
Pork	Bq/kg	< 4.0E-02	-	2.4E-01	89	32
Poultry	Bq/kg	< 5.0E-02	-	4.1E-01	47	18
Other meat	Bq/kg	1.2E-01	-	1.8E-01	7	7
Wild-animal meat	Bq/kg	< 5.0E-02	-	5.4E+02	84	61
Fish	Bq/kg	< 5.0E-02	-	9.4E-01	39	24
Honey	Bq/kg	< 5.0E-02	-	1.9E+00	13	6
Fruits	Bq/kg	< 5.0E-02	-	< 5.0E-02	6	0
Vegetable	Bq/kg	< 5.0E-02	-	< 5.0E-02	8	0
Forest fruits	Bq/kg	8.4E-01	-	7.8E+02	21	21
Mushrooms	Bq/kg	3.8E+00	-	8.9E+03	51	51

Note:
*) a **) See notes below Table No. 14 a.
MVA – minimum significant activity for reliability level 95%.

Table No. 14c Activity mass and concentration of ^{137}Cs in selected foodstuffs in the year 2005 (sampling by the RC SÚJB, SÚRO, SVÚ, SZPI, VÚLHM and VÚV T.G.M., measuring by the RC SÚJB, SÚRO and SVÚ)

Component	Unit	Range of measured values *)			Number of measurements	
					Total	> MVA
Milk ***)	Bq/l	< 5.0E-03	-	9.3E-01	119	102
Beef	Bq/kg	< 4.0E-02	-	4.0E+00	191	94
Pork	Bq/kg	< 3.1E-02	-	2.4E-01	118	43
Poultry	Bq/kg	< 5.0E-02	-	4.1E-01	75	29
Other meat	Bq/kg	< 3.5E-02	-	1.8E-01	19	10
Wild-animal meat	Bq/kg	< 5.0E-02	-	1.3E+03	87	64
Fish	Bq/kg	< 3.8E-02	-	9.4E-01	44	28
Honey	Bq/kg	< 5.0E-02	-	1.9E+00	13	6
Fruits	Bq/kg	< 1.1E-02	-	4.2E-02 **)	26	2
Vegetable	Bq/kg	< 9.9E-03	-	1.7E-01 **)	29	3
Forest fruits	Bq/kg	< 2.1E-02	-	7.8E+02	37	33
Mushrooms	Bq/kg	< 2.4E-01	-	8.9E+03	75	74

Note:
MVA – minimum significant activity for reliability level 95%.
*) a **) See notes below Table No. 14a.
***) The item includes also the samples of milk measured at SVÚ, activity concentration of which was estimated by means of activity mass of powdered milk and concentration factor 5 to 10.

Table No. 15 Activity concentration of ^{90}Sr in milk in the year 2005 (sampling and measuring by the SÚRO in Hradec Králové, Ostrava and Prague)

Supplier	Quarter	Activity concentration [Bq/l]
Dairy works of the Central Bohemian Region	1	1.7E-02
	2	3.1E-02
	3	3.3E-02
	4	5.1E-02
Business network of the Moravian-Silesian Region	1	4.2E-02
	2	4.9E-02
	3	2.4E-02
	4	3.5E-02
Business network of the Region of Olomouc	1	8.3E-02
	2	4.6E-02
	3	3.0E-02
	4	-

Contd. Table No. 15 Activity concentration of ^{90}Sr in milk in the year 2005 (sampling and measuring by the SÚRO in Hradec Králové, Ostrava and Prague)

Supplier	Quarter	Activity concentration [Bq/l]
Dairy works in Kunín	1	3.1E-02
	2	7.7E-02
	3	2.9E-02
	4	1.8E-02
Dairy works in Olomouc	1	4.6E-02
	2	7.3E-02
	3	3.9E-02
	4	2.4E-02
Dairy works in Valašské Meziříčí	1	7.3E-02
	2	3.4E-02
	3	3.2E-02
	4	2.0E-02
Dairy works in Zábřeh	1	4.0E-02
	2	5.7E-02
	3	1.5E-02
	4	6.1E-02

Note:
Random sampling was performed in the indicated quarter.

Table No.16a Activity mass of ^{137}Cs in cereals and in potatoes in the year 2005 (sampling and measuring by the RC SÚJB and SÚRO)

Product	Activity mass [Bq/ kg]
Barley	2.6E-02
Oat	7.3E-02
Wheat	4.0E-02
Rye	5.5E-02
Potatoes	3.5E-02

Note:
One concentrated sample from the whole Czech Republic was measured for each commodity.

Table No. 16b Activity mass of ^{137}Cs in cereals and in potatoes in the year 2005 (sampling by the SZPI, measuring by the SVÚ)

Component	Activity mass [Bq/ kg]*)	Number of measurements	
		Total	> MVA
Barley	< 5.0E-02	2	0
Oat	< 3.5E-02 - 1.0E-01	2	1
Wheat	< 5.0E-02	2	0
Rye	1.1E-1	2	2
Potatoes	< 3.0E-02 - 1.0E-01	4	1

Note:
MVA – minimum significant activity for reliability level 95%.
Sign "<" – minimum significant activity for reliability level 95%.
*) With regard to data file properties, the range of measured values is used as data file characteristics; in the event that the file contains some values below MVA, the lowest MVA value is indicated; in the event that there was no value detected above MVA, the range of MVA values is indicated.

Table No. 17 Activity mass of ^{90}Sr in cereals in the year 2005 (sampling and measuring by the SÚRO in Prague) – crop 2005

Cereals	Sampling point	Activity [Bq/kg]
Wheat	Central Bohemia	1.2E-01
Barley	Central Bohemia	1.2E-01

Note:
Estimate of combined uncertainty of determination 90Sr at reliability level 95% is 10%.

Table No. 18 Activity mass and concentration of ^{137}Cs in selected feedstuffs in the year 2005 (sampling by the ÚKZÚZ, measuring by the SVÚ in Prague)

Component	Range of measured values [Bq/ kg]*)	Number of measurements	
		Total	> MVA
Fodder grass	< 5.0E-02 – 4.1E+0	13	11
Silage	< 7.0E-01 – 2.8E-01	3	2
Feedstuff	< 5.0E-02 – 3.3E+0	12	6
Fodder	< 5.0E-02 – 2.3E+01	42	33

Note:
MVA – minimum significant activity for reliability level 95%.
Sign "<" – minimum significant activity for reliability level 95%.
*) With regard to data file properties, the range of measured values is used as data file characteristics; in the event that the file contains some values below MVA, the lowest MVA value is indicated;

Table No. 19 Activity concentration of noble gases from the samples taken from Dukovany NPP ventilation stacks (sampling and measuring by the SÚRO in Prague)

Ventilation stack		VK - 1	VK - 2
Date of sampling		**29.9.2005**	**29.9.2005**
Nuclide	**Half life**	**[Bq/m³]**	
^{41}Ar	1.82 h	290	560
^{85}Kr	10.7 y	< 1	5
^{133}Xe	5.25 d	< 10	< 10
^{135}Xe	9.10 h	< 5	< 20

Note:
Sign "<" indicates the minimum significant activity for reliability level 95%.
The measuring was performed at SÚRO laboratory in Prague several hours after sampling so the radionuclides with short half-life periods could not be determined.
The arithmetic mean of activity concentrations determined from measurement of 2 samples is indicated for individual days.
Sampling was performed during the outage of Unit 1 reactor, other three reactors were in normal operation.

Table No. 20 Activity concentrations [Bq/m³] of ^{14}C in Dukovany NPP ventilation stacks (sampling by the SÚRO in Prague, measuring by the ODZ ÚJF AV ČR)

Ventilation stack	VK - 1		VK - 2	
Date of sampling	**Combustible forms**	**CO_2**	**Combustible forms**	**CO_2**
	[Bq/m³]		**[Bq/m³]**	
16.10.2002	Not valued	Not valued	15.8	6.2
16.4.2003	7.4	1	6.3	1.6
29.4.2004	< 1.5	2.9	10.8	4.1
8.7.2004	33.2	< 1.0	32.3	4
29.9.2005	21.4*)	5.6*)	17.2	2.8

Note:
Sign "<" indicates the minimum significant activity for reliability level 95%.
*) Sampling performed during the outage of Unit 1 reactor, other three reactors were in normal operation.

Table No. 21 Activity of ^{90}Sr and transuranium elements discharged to the atmosphere from Dukovany NPP in the year 2005 (sampling by the LRKO at Dukovany NPP, measuring by the SÚRO in Prague)

Quarter	Ventilation stack	Activity [Bq]					
		^{238}Pu	^{239,240}Pu	^{241}Am	^{242}Cm	^{243,244}Cm	^{90}Sr
1	VK - 1	71	61	79	<40	71	<530
2		250	110	240	<26	400	<720
3		370	180	250	290	430	820
4		480	240	340	340	620	380
Total		11171	591	909	>630<696	1521	>1200;<2450
1	VK - 2	73	50	120	150	83	430
2		52	38	<23	<64	<27	<310
3		<34	<34	<22	<34	<20	<540
4		<29	<33	<47	<58	<37	400
Total		>125<188	>88<155	>120<212	>150<306	>83<167	>830;<1680

Note:
Sign “<” indicates the minimum significant activity for reliability level 95%.

Table No. 22 Overview of activities of individual radionuclides discharged to the air from Dukovany NPP in the year 2005 (taken from the Dukovany NPP Report)

	Ventilation stack 1	Ventilation stack 2
	Activity, activity range [GBq, MBq, kBq]	
Noble gases [GBq]		
Total[1)]	6 680	
^{133}Xe	159	111
^{135}Xe	168	42.6
^{3}H [GBq]	359	436
^{131}I in total [MBq]	<10.6	
Gaseous form	<5.20	<5.20
^{14}C *) [GBq]	799	
Aerosols [kBq]		
^{51}Cr	>1 180; <2 000	>3 000; <3 750
^{54}Mn	>814; <858	>3 370; <3 380
^{59}Fe	>147; <333	>616; <787
^{57}Co	<83.2	>4.41; <86.0
^{58}Co	>2 070; <2 130	>7 520; <7 550
^{60}Co	>2 430; <2 450	>6 690; <6 700
^{65}Zn	<276	<276
^{75}Se	<146	<146
^{95}Zr	>317; <480	>834; <987
^{95}Nb	>763; <837	>1 740; <1 810
^{103}Ru	>82.5; <183	<104
^{110m}Ag	>1 730; <2 110	>2 700; <3 050
^{124}Sb	>1 090; <1 190	>2 700; <3 050
^{134}Cs	<104	<104
^{137}Cs	<120	>45.4; <160
^{141}Ce	<146	<146
^{144}Ce	<624	>127; <726
^{131}I	<114	<114
^{76}As	>196; <400	>780; <984
^{181}Hf	>170; <266	>110; <208
^{89}Sr	<12.0	<12.0
^{90}Sr	< 1.32	<1.32

Note:
1) Summary value VK 1 + VK 2 (^{41}Ar, ^{85}Kr, ^{85m}Kr, ^{87}Kr, ^{88}Kr, ^{133}Xe, ^{135}Xe, ^{135m}Xe, ^{138}Xe)
*) Summary value VK 1 + VK 2

Table No. 23 Overview of radioactive substances discharged to the streams from Dukovany NPP in the year 2005 (taken from the Dukovany NPP Report)

	Activity [GBq, kBq]	
	1st two-unit block	**2nd two-unit block**
^{3}H [GBq]	7 740	6 160
Other radionuclides		
[kBq]		
^{51}Cr	<1 380	<1 440
^{54}Mn	>2 050; <2 080	>2 020; <2 090
^{59}Fe	<276	<288
^{57}Co	<115	<120
^{58}Co	>2 470; <2 500	>2 930; <2 990
^{60}Co	>4 090; <4 130	>3 200; <3 240
^{65}Zn	<391	<408
^{75}Se	<207	<216
^{95}Zr	<276	<288
^{95}Nb	<138	<144
^{103}Ru	<138	<144
^{110m}Ag	>1 050; <1 180	<216
^{124}Sb	>163; <317	>763; <924
^{134}Cs	>640; <748	>168; <306
^{137}Cs	>2 990; <3 050	>1 730; <1 790
^{141}Ce	<207	<216
^{144}Ce	<920	<960
^{131}I	<161	<168
^{89}Sr	<420	<420
^{90}Sr	<24.0	<24.0

Note:
Indicated values are summary of 12 values from monthly measurements.

Table No. 24 Activity concentrations of noble gases from the samples taken from Temelín NPP internal ventilation stacks (sampling by the ČEZ, a.s. – Temelín NPP, measuring by the SÚRO in Prague)

Ventilation stack		**HVB - 1**			**HVB - 2**		**BAPP**
Date of sampling		**31.3.2005 ***	**25.5.2005**	**14.12.2005**	**31.3.2005**	**17.8.2005**	**17.8.2005**
Nuclide	**Half life**	**[Bq/m^3]**					
^{41}Ar	1.82 h	< 100 *	660	620	900	500	< 60
^{85}Kr	10.7 y	300 *	4	89	9	15	< 1
^{85m}Kr	4.48 h	< 40 *	< 30	< 10	140	< 70	< 70
^{87}Kr	1.27 h	Not valued	< 100	< 130	< 100	< 300	< 230
^{88}Kr	2.86 h	< 60 *	< 40	< 40	< 80	< 80	< 80
^{133}Xe	5.25 d	23000 *	900	80	< 200	< 500	< 470
^{133m}Xe	2.19 d	130 *	< 20	< 10	< 10	< 20	< 20
^{135}Xe	9.10 h	85 *	150	80	370	300	< 20

Note:
Sign "<" indicates the minimum significant activity for reliability level 95%.
The measuring was performed at SÚRO laboratory in Prague several hours after sampling so the radionuclides with short half-life periods could not be determined.
The arithmetic mean of activity concentrations determined from measurement of 2 samples is indicated for individual days.
* Sampling was performed several days after the beginning of the reactor outage.
Samplings from HVB-1 and HVB-2 are performed only from internal ventilation stacks.

Table No. 25 Activity concentrations of ^{14}C in Temelín NPP ventilation stacks (sampling by the ČEZ, a.s. – Temelín NPP, measuring by the ODZ ÚJF AV ČR)

Ventilation stack (VK)	**Internal VK HVB-1**		**Internal VK HVB-2**		**BAPP**	
Date of sampling	**Combustible forms**	**CO_2**	**Combustible forms**	**CO_2**	**Combustible forms**	**CO_2**
	[Bq/m^3]		**[Bq/m^3]**		**[Bq/m^3]**	
31.5.2002	290	9.2	Unit not in operation		Not valued	
8.10.2002	65	6.3	Unit not in operation		Not valued	
22.1.2003	55	6.5	Unit not in operation		Not valued	
25.6.2003	211	14	Unit not in operation		Not valued	
12.12.2003	1480	22	Unit not in operation		Not valued	
12.12.2003	520	16	Unit not in operation		Not valued	
4.2.2004	22	57	319	10	Not valued	
26.5.2004	Unit shut down		14	1.9	Not valued	
8.9.2004	180	2.7	210	8	Not valued	
31.3.2005	89*	5.3*	37	1.6	Not valued	
25.5.2005	56	3.2	Unit shut down		Not valued	
17.8.2005	Unit shut down		59	< 0.6	2.6	< 0.9
14.12.2005	<0.7		Unit shut down		Not valued	

Note:
Sign "<" indicates the minimum significant activity for reliability level 95%.
Unless otherwise stated, samplings are performed during normal operation of reactors.
* Sampling was performed several days after the beginning of the reactor outage.

Table No. 26 Activity of ^{90}Sr and transuranium elements discharged to the atmosphere from Temelín NPP in the year 2005 (sampling by the LRKO at Temelín NPP, measuring by the SÚRO in Prague)

Quarter	Unit	Ventilation stack *)	Activity [Bq]					
			^{238}Pu	^{239,240}Pu	^{241}Am	^{242}Cm	$^{243, 244}$Cm	^{90}Sr
1	HVB-1	Internal	<4.5	<4.9	<6.9	<19	<3.5	<220
		External	-	-	-	-	-	-
2		Internal			45	<15	<5.2	<120
		External			110	<51	<13	<340
3		Internal	65	<5.5	<15	<16	<6.5	120
		External	71	<8.2	<74	<39	<12	160
4		Internal	150	<11	<3.6	<3.3	<1.6	100
		External	<11	<13	<9.3	<6.5	<5.0	<250
Total			>286; <341	>101; <144	>155; <264	<150	<47	>380; <1310
1	HVB-2	Internal	<7.0	<8.1	<4.5	<20	<3.6	150
		External	-	-	-	-	-	-
2		Internal			18	<24	<3.8	<82
		External			68	<79	<13	<190
3		Internal	8.8	<4.7	<53	<22	<8.8	<250
		External	5	<2.6	7.5	<9.0	<3.1	<83
4		Internal	60	<12	<5.8	<4.3	<2.0	<220
		External	-	-	-	-	-	-
Total			-	-	-	-	-	>150; <975
1	BAPP		<45	<45	<35	<110	<18	670
2								400
3			120	27				<900
4			160	39	<23	<20	<9.0	<500
Total			>560; <605	>66; <149	>190; <328	>240; <417	<102	>1070; <2470

Note:
Sign “<” indicates the minimum significant activity for reliability level 95%.
*) The internal ventilation stack is in continuous operation; the external ventilation stack is operated only during nuclear reactor outage.

Table No. 27 Overview of activities of individual radionuclides discharged to the air from Temelín NPP in the year 2005 (taken from the Temelín NPP Report)

	BAPP	HVB 1 internal stack	HVB 1 external stack	HVB 2 internal stack	HVB 2 external stack	Total
Activity, activity range [GBq, MBq, kBq]						
Noble gases [GBq]						
Total[1)]	5 700					
^{133}Xe	-	>755; <757	1 560	>564; <573	>120; <122	>3 000; <3 010
^{135}Xe	-	>180; <182	>2.03; <2.90	>783; <786	>0.0851; <1.38	>965; <972
^{41}Ar	-	>418; <421	<1.67	>693; <696	<2.11	>1 110; <1 120
^{87}Kr	-	>19.8; <26.2	<2.06	>67.0; <76.4	<2.79	>86.8; <107
^{88} Kr	-	>36.0; <49.0	<2.89	>179; <196	<4.06	>215; <252
^{3}H [GBq]	228	500	214	842	350	2 130
^{131}I in total [MBq]*	>59.0; <59.4					
Gaseous form	-	>8.40; <8.56	16.3	>6.40; <6.45	>26.2; <26.3	>49.1; <57.6
^{14}C [GBq]	>3.64; <3.65	179	>0.634	227	>0.992; <0.998	>233; <412
Aerosols [kBq]						
^{51}Cr	>256; <915	>14.3; <159	>90.7; <133	>102; <201	>1 160; <1 190	>1 620; <2 600
^{54}Mn	>59.6; <106	>2.30; <15.4	>27.4; <30.6	>6.87; <17.2	>131; <133	>227; <301
^{57}Co	<55.5	<11.7	<3.87	>2.68; <9.77	<7.48	>2.68; <84.4
^{58}Co	>145; <188	>10.9; <23.7	>13.2; <17.3	>64.3; <74.3	>680 <682	>914; <985
^{60}Co	>98.3; <146	>5.38; <21.7	>33.3; <36.1	>3.41; <16.4	>33.3; <42.2	>174; <262
^{95}Zr	>203; <307	>5.40; <29.2	>218; <226	<19.4	>166; <178	>593; <760
^{95}Nb	>528; <570	>12.1; <29.1	>360; <363	>7.67; <19.0	>590; <591	>1 500; <1 570
^{103}Ru	<75.3	<15.9	<6.17	<11.0	>3.71; <13.5	>3.71; <122
^{124}Sb	>469; <529	>21.7; 35.0	>113; <118	>802; <810	>2 180; <2 210	>3 580; <3 700
^{134}Cs	>87.4; <149	>9.34; <21.8	<7.13	<16.0	<28.5	>96.7; <223
^{137}Cs	>73.9; <136	>6.97; <21.3	>4.10; <8.09	0.387; <11.6	<11.4	>85.3; <174
^{131}I	>50.2; <180,4	>140; <162	>72.4; <78.5	>116; <131	>1 300; <1 310	>1 680; <1 840

Contd. Table No. 27 Overview of activities of individual radionuclides discharged to the air from Temelín NPP in the year 2005 (taken from the Temelín NPP Report)

	BAPP	HVB 1 internal stack	HVB 1 external stack	HVB 2 internal stack	HVB 2 external stack	Total
Activity, activity range [GBq, MBq, kBq]						
Noble gases [GBq]						
^{76}As	<1 480	<440	<240	<258	<421	<2 840
^{89}Sr	203	23.3	59.5	25.7	67.5	379
^{90}Sr	<21.7	<3.53	<8.06	<3.85	<7.28	<44.5

Note:

1) Summary value of activities of BAPP + HVB1(internal stack) + HVB1(external stack) + HVB2(internal stack) + HVB2(external stack) (41Ar, 85Kr, 85mKr, 87Kr, 88Kr, 133Xe, 135Xe, 135mXe, 138Xe)

*) Summary value of BAPP + HVB1(internal stack) + HVB1(external stack) + HVB2(internal stack) + HVB2(external stack)

Table No. 28 Overview of activities of radioactive substances discharged to the hydrosphere from Temelín NPP in the year 2005 (taken from the Temelín NPP Report)

	Activity					
Tank designation	ORY50BO1	OTR30B02	OTR80B01	OTR80B02	OTR90B03	OTZ01B02
^{3}H [GBq]	0.238	249	15 100	14 200	10.6	3.00
Other radionuclides [MBq]						
^{51}Cr	<22.5	<0.295	>0.294; <86.2	<86.4	<20.2	<2.30
^{54}Mn	>0.0241; <2.80	<0.0273	>0.220; <10.4	>0.0513; <10.1	<2.44	>0.379; <0.539
^{59}Fe	<4.39	<0.0527	<16.6	<16.4	<4.11	<0.447
^{57}Co	<2.18	<0.0297	<8.41	<8.37	<1.97	<0.214
^{58}Co	<2.41	<0.0262	<8.96	<8.93	<2.09	>0.0842; <0.292
^{60}Co	<2.75	<0.0333	<10.0	<9.97	<2.31	<0.287
^{65}Zn	<4.89	<0.0636	<18.9	<18.2	<4.52	<0.494
^{95}Zr	>0.266; <4.65	<0.0511	<16.7	<16.3	<3.92	>0.0521; <0.484
^{95}Nb	>0.230; <3.27	<0.0299	>0.642; <11.4	>0.143; <11.1	<2.74	>0.207; <0.451
^{103}Ru	<2.56	<0.0326	<9.68	>0.0826; <9.61	<2.28	<0.272
^{110m}Ag	<3.17	<0.0340	<11.6	<11.6	<2.74	>0.0382; <0.402
^{124}Sb	>0.154; <3.55	<0.0483	>0.335; <13.2	<13.4	<2.87	>0.758; <1.14
^{134}Cs	> 0.822; <4.17	<0.0454	>2.59; <15.1	>8.59; <21.3	>0.302; <3.27	>1.26; <1.45
^{137}Cs	>1.04; <3.95	<0.0478	>4.08; <14.8	>10.3; 20.1	>0.312; <3.02	>1.16; <1.35
^{141}Ce	<3.91	<0.0494	<15.3	<15.2	<3.58	<0.388

Contd. Table No. 28 Overview of activities of radioactive substances discharged to the hydrosphere from Temelín NPP in the year 2005 (taken from the Temelín NPP Report)

Activity						
Tank designation	OTZ02B02	OUG01BO01	OUG01BO02	OUG02BO01	OUG02BO02	Total
^{131}I [MBq]	<2.88	<0.0362	>1.15; <11.5	>1.78; <12.0	<2.56	>0.0477; <0.335
^{3}H [GBq]	94.9	5.39	3.81	0.191	0.158	29 600
Other radionuclides [MBq]						
^{51}Cr	<3.26	>0.948; <18.3	<16.8	<2.68	<2.72	>1.24; <262
^{54}Mn	>0.453; <0.659	10.2	>13.9; <14.0	>0.660; <0.761	>0.591; <0.719	>26.5; <52.7
^{59}Fe	<0.589	<2.97	<2.89	<0.506	<0.473	<49.5
^{57}Co	<0.296	<1.52	<1.45	<0.255	<0.246	<24.9
^{58}Co	>0.0249; <0.353	>5.85; <6.51	>2.43; <3.22	>0.0517; <0.320	>0.930; <1.18	>9.37; <34.3
^{60}Co	<0.390	>5.04; <6.02	>6.06; <6.61	>0.457; <0.718	>0.236; <0.559	>11.8; <39.6
^{65}Zn	<0.668	<3.29	<3.22	<0.579	<0.541	<55.4
^{95}Zr	<0.597	>4.64; <7.25	>11.9; <13.8	>0.380; <0.836	>0.181; <0.645	>17.4; <65.2
^{95}Nb	>0.0272; <0.436	>13.7; <14.2	>25.0; <25.4	>1.12; <1.29	>0.498; <0.732	>41.5; <71.0
^{103}Ru	<0.378	<2.13	<2.08	<0.318	<0.328	> 0.0826; <29.7
^{110m}Ag	<0.537	>4.70; <6.72	>6.50; <7.96	>0.812; <1.13	>0.129; <0.556	>12.2; <46.5
^{124}Sb	>2.26; <2.81	>35.7; <36.5	>30.8; <31.0	>1.07; <1.51	>0.444; <0.976	>71.5; <107
^{134}Cs	>3.76; <3.95	47.3	>37.5; <37.6	>1.76; <1.88	>4.71; <4.87	>109; <141
^{137}Cs	>3.76; <3.91	41.3	33.9	>1.90; <2.01	>3.92; <4.04	>102; <128
^{141}Ce	<0.536	<2.70	<2.55	<0.453	<0.438	<45.1
^{131}I	>0.0556; <0.471	>6.02; <7.31	>5.94; <7.39	>0.106; <0.402	>0.400; <0.663	>15.5; <45.6

Table No. 29 Activity concentrations of noble gases and ^{14}C from the samples taken from ÚJV Řež nuclear reactor ventilation stack in the year 2005 (sampling and measuring by the SÚRO in Prague)

Date of sampling		8.12.2005
Nuclide	Half life	[Bq/m^3]
^{41}Ar	1.82 h	430 000
^{85}Kr	10.7 y	3.2
^{85m}Kr	4.48 h	300
^{87}Kr	1.27 h	1 300
^{88}Kr	2.86 h	350
^{133}Xe	5.25 d	150
^{133m}Xe	2.19 d	< 20
^{135}Xe	9.10 h	780
^{14}C (combustible forms)	5730 y	2.1
^{14}C (CO_2)		8.5

Note:
Sign “<” indicates the minimum significant activity for reliability level 95%.
The value is arithmetic mean of activity concentrations determined from measurement of 2 samples.

Table No. 30a Dukovany NPP vicinity in the year 2005 (taken from the Dukovany NPP Report)

Activity concentration, surface and mass of selected radionuclides in aerosols [Bq/m3], in monthly fallouts [Bq/m2] and in environmental components [Bq/kg,l] - sampling and measuring by the LRKO.

Component	Mean value	95% tolerance interval	Number of measurements	Of which >MDA
^{137}Cs				
Aerosols	-	<3.0E-06*)	52	0
Total fallouts[&)]	-	<4.0E-01*)	12	0
Soil	2.6E+01	2.7E-01 – 8.1E+02	8	8
Surface water	-	<1.4E-02*)	16	0
Drinking water	-	<1.4E-02*)	7	0
Underground water	-	<1.4E-02*)	12	0
Milk	-	<4.0E-02*)	36	0
Cereals [a)]	-	<8.0E-02*)	2	0
Apples [&)]	-	<8.0E-02*)	1	0
Cabbage [&)]	-	<8.0E-02*)	1	0
Potatoes [&)]	-	<8.0E-02*)	1	0

Contd. Table No. 30a Dukovany NPP vicinity in the year 2005 (taken from the Dukovany NPP Report)

Activity concentration, surface and mass of selected radionuclides in aerosols [Bq/m3], in monthly fallouts [Bq/m2] and in environmental components [Bq/kg,l] - sampling and measuring by the LRKO.

Component	Mean value	95% tolerance interval	Number of measurements	Of which >MDA
^{137}Cs				
Feedstuff [a)]	-	<8.0E-02*)	3	0
Waste channel sediments	-	<2.0E+00	1	0
Other sediments	-	5.5E+00 - 1.1E+01*)	2	2
^{90}Sr				
Surface water	-	<8.0E-03*)	10	0
Milk	-	2.1E-02 - 2.9E-02*)	3	3
Apples [&)]	-	<3.0E-02*)	1	0
Cabbage [&)]	-	7.0E-02*)	1	1
Potatoes [&)]	-	6.0E-02*)	1	0
Cereals [a)]	-	5.0E-02 - 2.2E-01*)	2	2
Feedstuff [a)]	-	1.0E-01 – 2.2E-01*)	3	3
^{3}H				
Surface water [1)]	4.6E+01	1.4E+01 – 1.3E+02	36	36
Surface water [2)]	-	<1.0E+01*)	20	0
Underground water, drill holes – vicinity of Dukovany NPP	-	<1.0E+01 – 5.8E+01*)	72	4
Underground water, wells – Dukovany NPP premises	3.2E+02	8.1E+00 – 2.4E+03	126	126
Underground water, drill holes – Dukovany NPP premises	7.2E+00	8.1E-02 – 7.0E+01	158	26
Drinking water	2.5E+01	1.1E+00 – 2.4E+02	16	11

Note:
*) With regard to data file properties, the range of values is used as data file characteristics.
&) Composite sample
a) Commodity includes indicated number of composite samples.
1) Surface water affected by effluents from NPP.
2) Surface water not affected by effluents from NPP.
MDA indicates minimum detectable activity.

Table No. 30b Temelín NPP vicinity in the year 2005 (taken from the Temelín NPP Report)

Activity concentration, surface and mass of selected radionuclides in aerosols [Bq/m3], in monthly fallouts [Bq/m2] and in environmental components [Bq/kg,l] - sampling and measuring by the LRKO.

Component	Mean value	95% tolerance interval	Number of measurements	Of which >MDA
^{137}Cs				
Aerosols	-	< 9.0E-07 - 1.4E-06	52	4
Fallouts	-	< 1.2E-01*)	12	0
Soil	3.5E+01	5.1E+00 – 1.9E+02	8	8
Surface water	-	<1.3E-02*)	40	1
Drinking water	-	<1.3E-02*)	8	0
Underground water		<1.3E-02*)	15	0
Milk	-	<1.3E-01	26	0
Cereals &)	-	<1.7E-01*)	2	0
Apples	<1.7E-01	-	1	0
Forest fruits	2.8E+00	-	1	1
Fish	-	1.1E-01 – 4.9E+00*)	3	3
Feedstuff &)	-	2.0E+00 - 3.4E+00	2	2
Waste channel sediments 3)	-	1.1E+01 – 2.9E+01*)	2	2
Other sediments	4.2E+00	-	1	1
^{90}Sr				
Surface water	-	<6.6E-02*)	3	0
Milk	-	<1.9E-01*)	12	0
^{3}H				
Surface water 1)	-	<2.8E+00 – 9.7E+01*)	40	20
Surface water 2)	-	<8.2E+00*)	12	0
Underground water, monitoring drill holes – vicinity of Temelín NPP	-	<8.1E+00*)	22	1
Underground water, wells – vicinity of Temelín NPP	-	<8.1E+00*)	6	0
Underground water, monitor. drill holes – Temelín NPP premises	-	<8.1E+00*)	12	0
Underground water, drainage wells - Temelín NPP premises	-	<8.5E+00*)	36	6
Drinking water	-	<8.5E+00*	30	1

Note:
&) Related to dry matter.
1) Surface water affected by effluents from NPP.
2) Surface water not affected by effluents from NPP.
3) Sediment samplings are performed at sampling points of river basin app. 2 km and 35 km below WCH outlet.
*) With regard to data file properties, the range of values is used as data file characteristics.
MDA indicates minimum detectable activity for reliability level 95%.

Table No. 31 Dukovany NPP and Temelín NPP vicinity in the year 2005 (measuring by the LRKO)
Results of the measurement of activity surface of 137Cs using field semiconductor spectrometry [Bq/m2]

Component	Mean value	95 % tolerance interval	Number of measurements	Of which >MDA
Dukovany NPP vicinity	2.1E+02	1.5E+01 – 2.0E+03	7	6
Temelín NPP vicinity	8.5E+02	1.7E+02 – 3.2E+03	24	20

Note:
MDA indicates minimum detectable activity for reliability level 95%.

Table No. 32a Dukovany NPP vicinity in the year 2005 (sampling by the RC SÚJB in Brno, measuring by the RC SÚJB in Brno and České Budějovice)
Activity concentration, surface and mass of selected radionuclides in monthly fallouts [Bq/m2] and in environmental components [Bq/kg,l].

Component	Mean value	95% tolerance interval	Number of measurements	Of which >MVA
^{137}Cs				
Total fallouts	-	1.0E+00 - 3.1E+00*)	20	5
Milk	-	<6.8E-02*)	15	0
Fresh fodder	-	<1.5E-01*)	5	2
Silage and fodder grass	-	<4.2E-02 - 7.5E-01*)	7	3
Cereals	-	<8.4E-02*)	6	0
Corn	-	<6.4E-02	1	0
Fruits	-	<1.7E-02*)	3	0
Forest fruits	-	<3.0E-02*)	3	0
Mushrooms	-	2.8E+01 - 3.2E+01*)	2	2
^{3}H				
Surface water 1)	1.1E+02	2.4E+00 – 8.8E+02	82	82
Surface water 2)	-	<1.5E+00*)	25	0
Drinking water 1)	9.4E+00	7.3E+00 – 1.2E+01	4	4
Drinking water 2)		<1.50E+00*)	4	0

Note:
1) Water affected by effluents from NPP.
2) Water not affected by effluents from NPP.
*) With regard to data file properties, the range of values is used as data file characteristics.
MVA indicates the minimum significant activity for reliability level 95%.

Table No. 32b Temelín NPP vicinity in the year 2005 (sampling and measuring by the RC SÚJB in České Budějovice)

Activity concentration, surface and mass of selected radionuclides in monthly fallouts [Bq/m2] and in environmental components [Bq/kg,l].

Component	Mean value	95% tolerance interval	Number of measurements	Of which >MVA
^{137}Cs				
Total fallouts	-	6.7E-02 - 2.8E-01*)	18	4
Milk	-	<5.7E-02*)	5	0
Potatoes	4.1E-02	-	1	1
Corn	<8.2E-02	-	1	0
Feedstuff	<5.6E-02	-	1	0
Fodder	-	3.9E-01 - 1.6E+00*)	2	2
Silage and fodder grass	-	5.9E-02 - 4.3E-01*)	4	4
Fruits	-	<7.0E-02*	7	0
Forest fruits	-	<4.8E-02 - 1.4E+01*)	3	1
Mushrooms	-	4.2E-01 - 2.6E+02*)	18	18
^{3}H				
Surface water 1)		<1.0E+00 - 1.2E+04*)	60	34
Surface water 2)	-	<1.5E+00*)	28	0
Underground water		<1.5E+00*)	9	0

Note:
1) Water affected by effluents from NPP.
2) Water not affected by effluents from NPP.
*) With regard to data file properties, the range of values is used as data file characteristics.
MVA indicates the minimum significant activity for reliability level 95%.

ANNEX NO. 2

Figure No. 1 Early Warning System (SVZ) within Radiation Monitoring Network in the Czech Republic

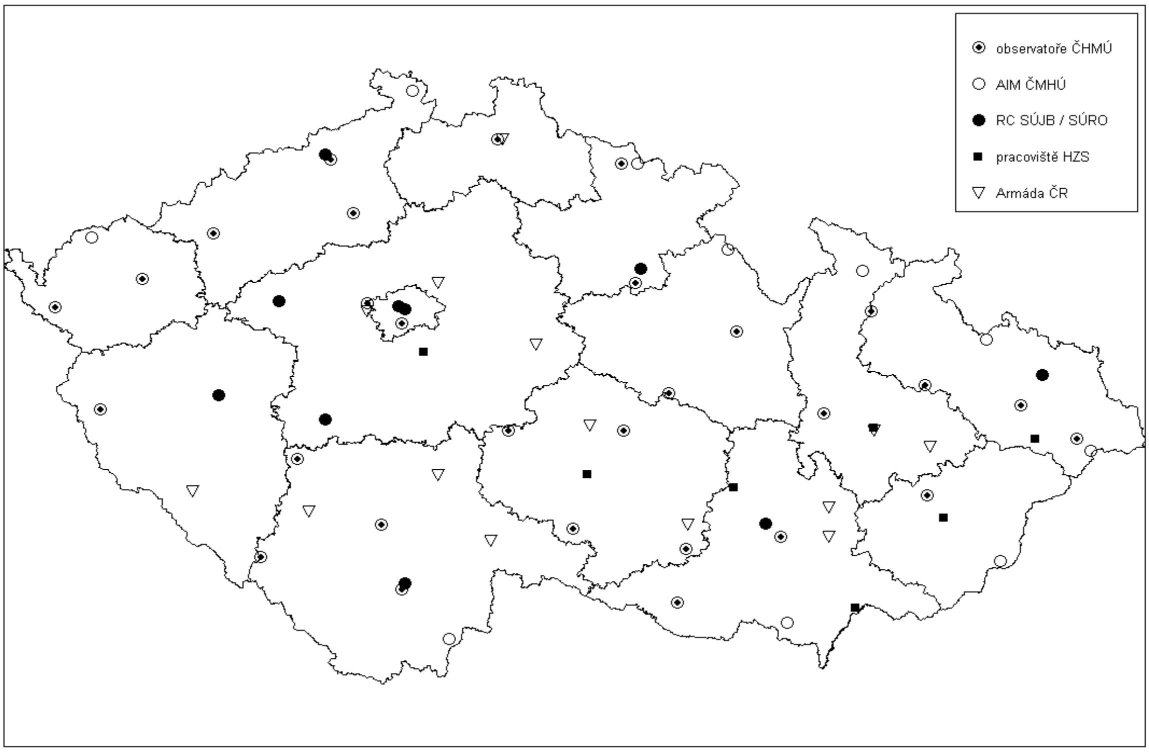


Figure No.2a SVZ Hradec Králové 2005 (measuring point at RC SÚJB)

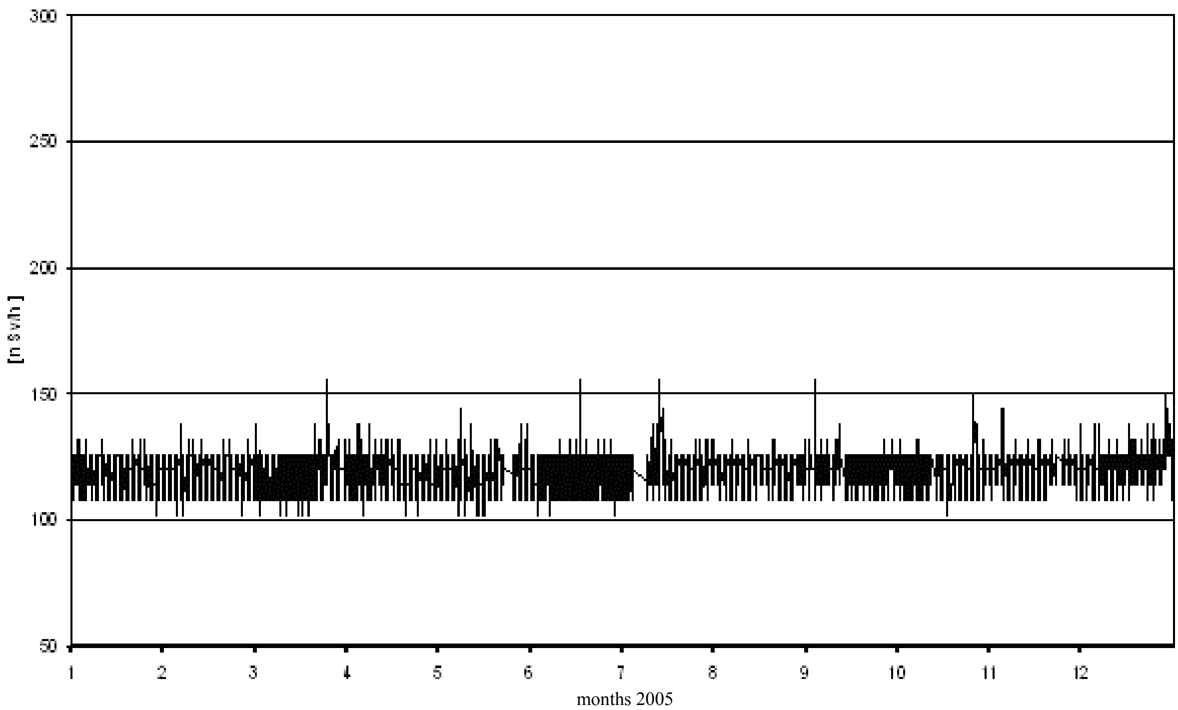


Figure No.2b SVZ Dukovany 2005 (measuring point at ČHMÚ observatory)

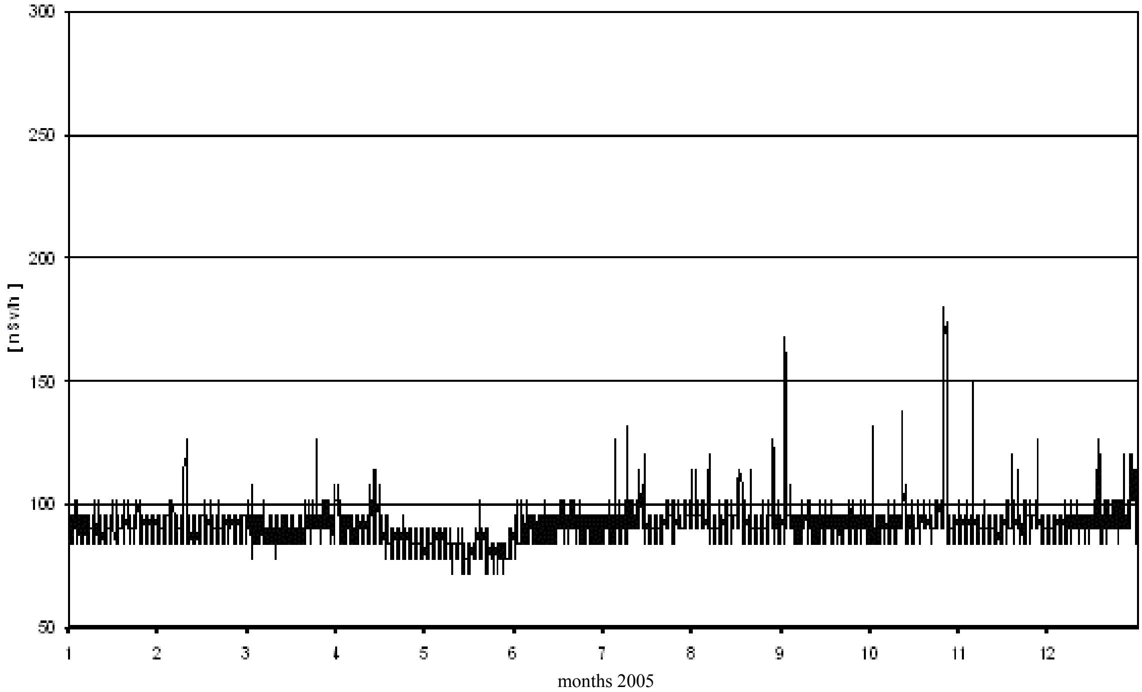


Figure No.2c SVZ Temelín 2005 (measuring point at ČHMÚ observatory)

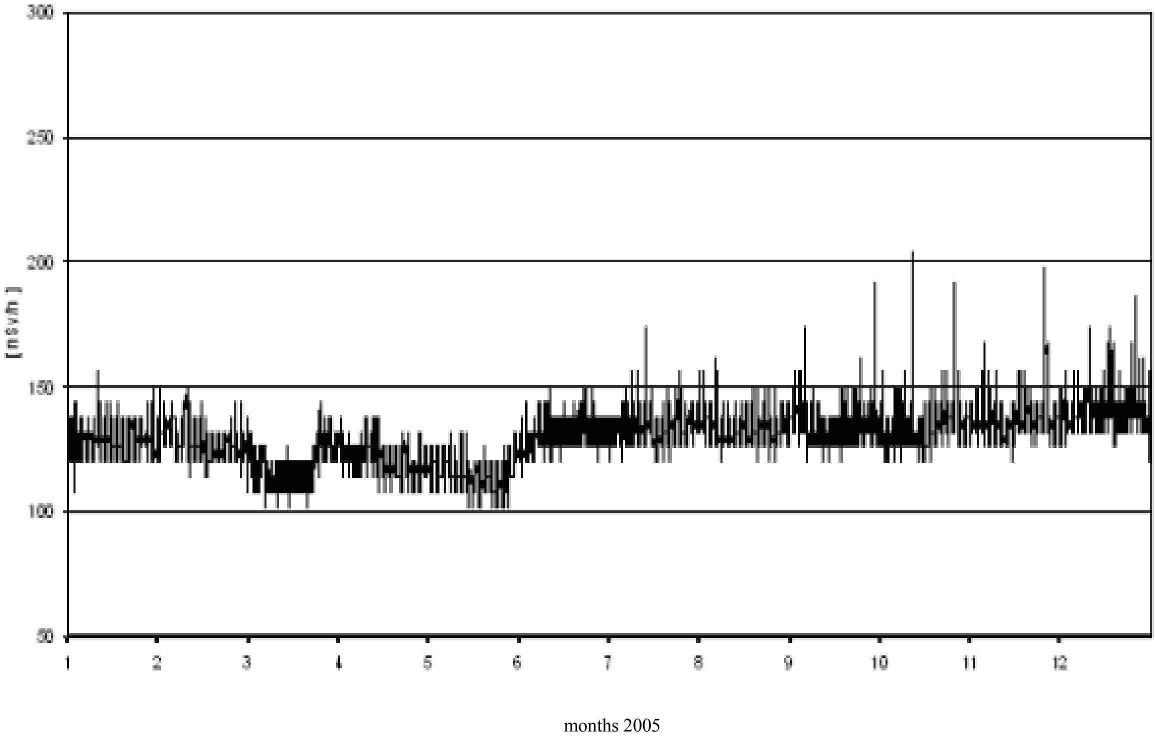


Figure No.2d SVZ Churáňov 2005 (measuring point at ČHMÚ observatory)

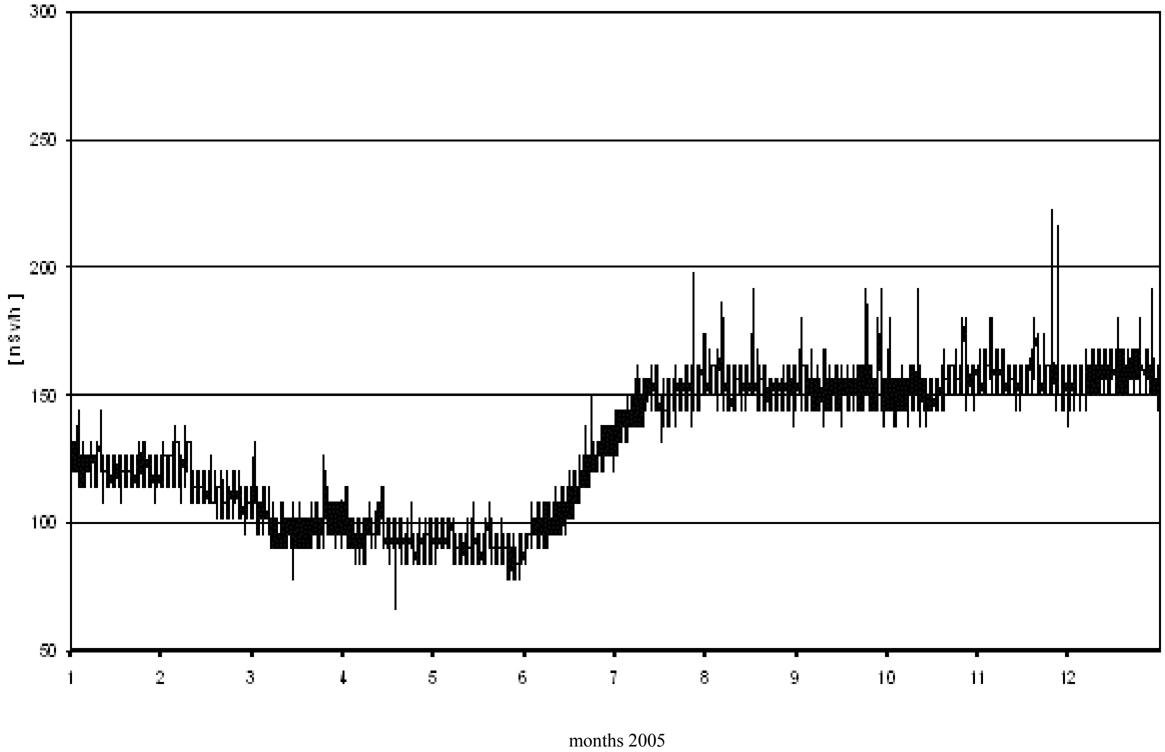


Figure No.2e TDS Dukovany NPP 2005 (measuring point No.13)

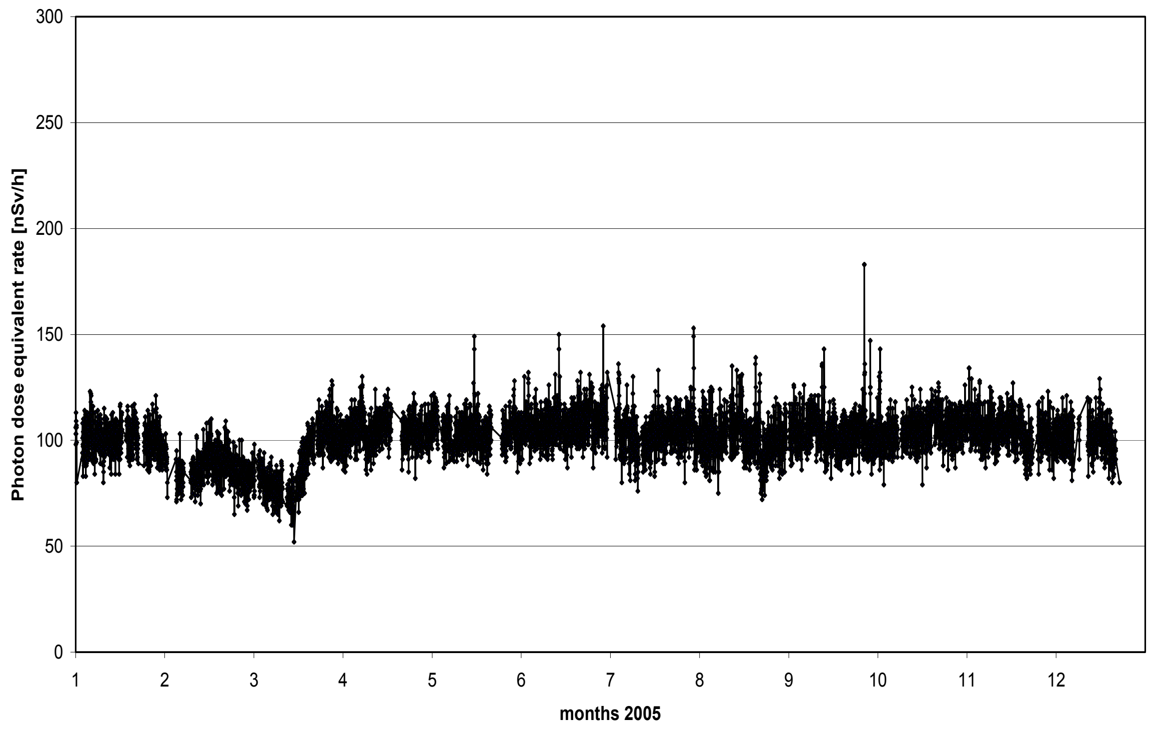


Figure No.2f TDS Temelín NPP 2005 (measuring point No. 13)

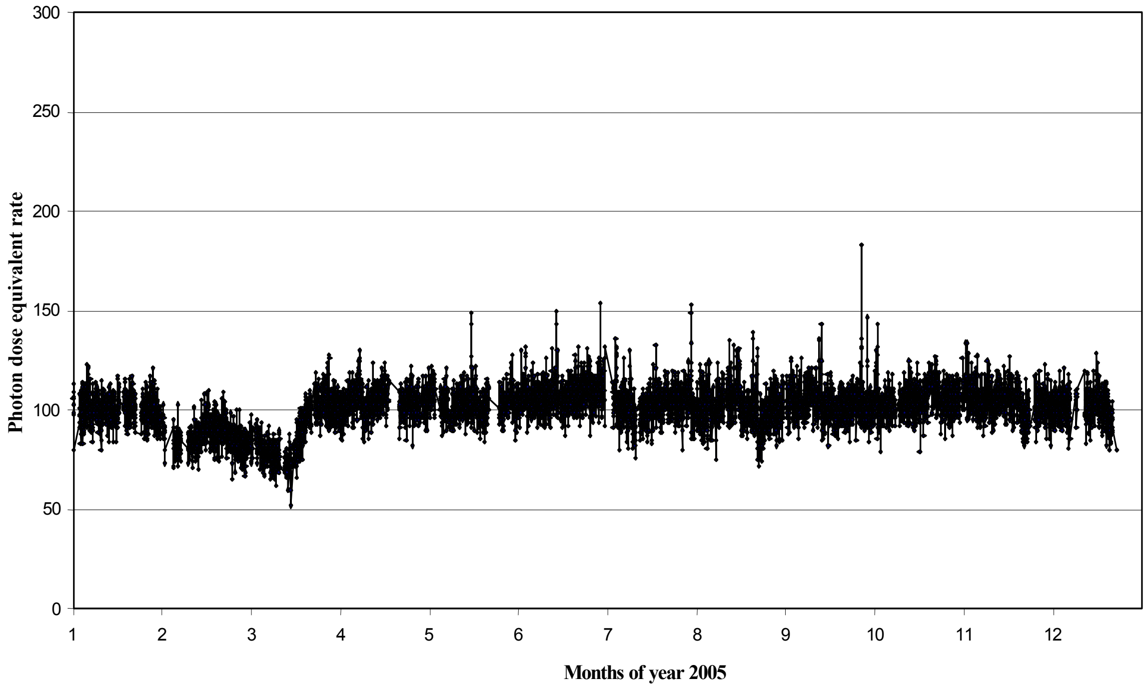


Figure No.3 Territorial and local TLD network

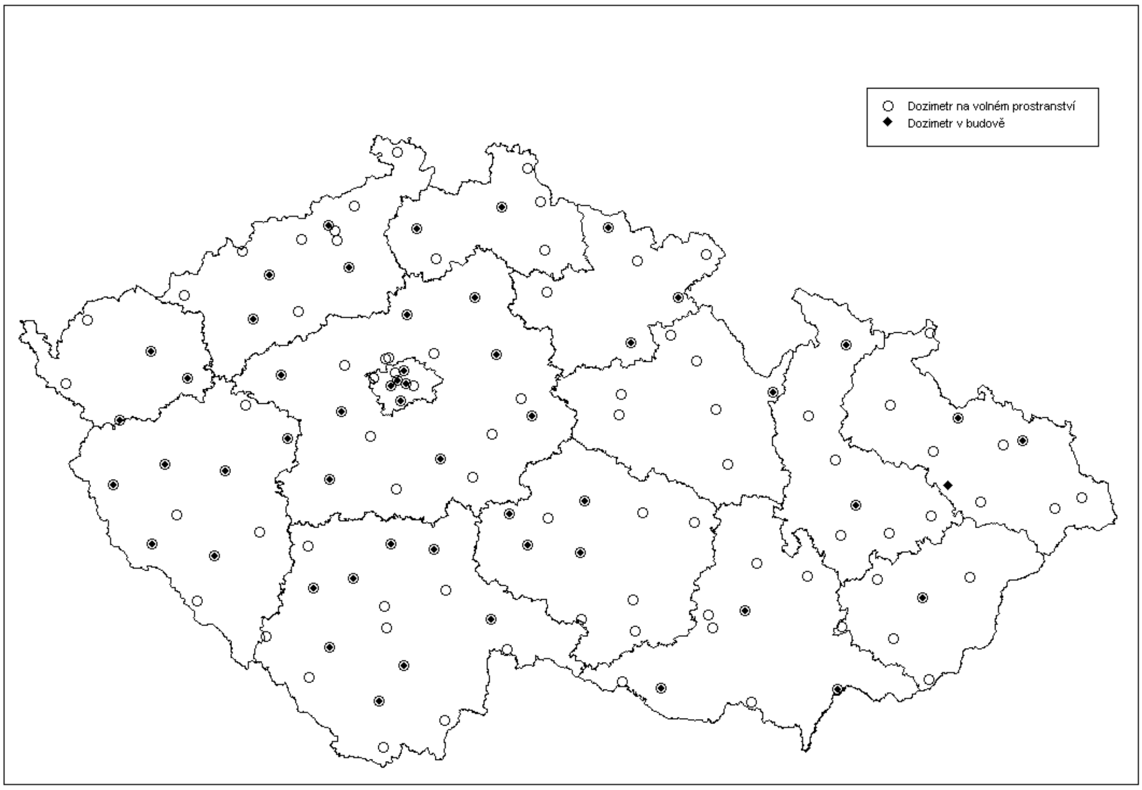


Figure No.4 Measuring of dose equivalent rate in travelling measurements within INEX 3 exercises

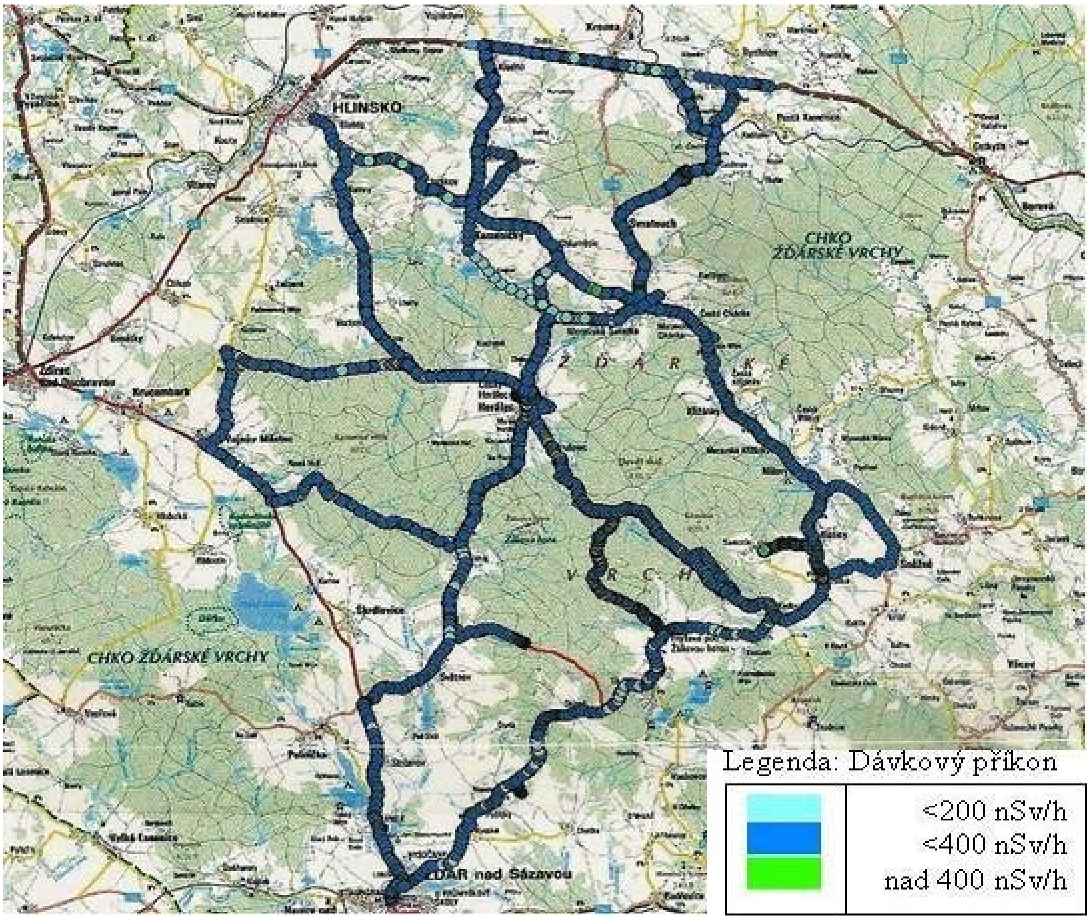


Figure No.5 Measuring of dose equivalent rates in TLD distribution in the fourth quarter 2005

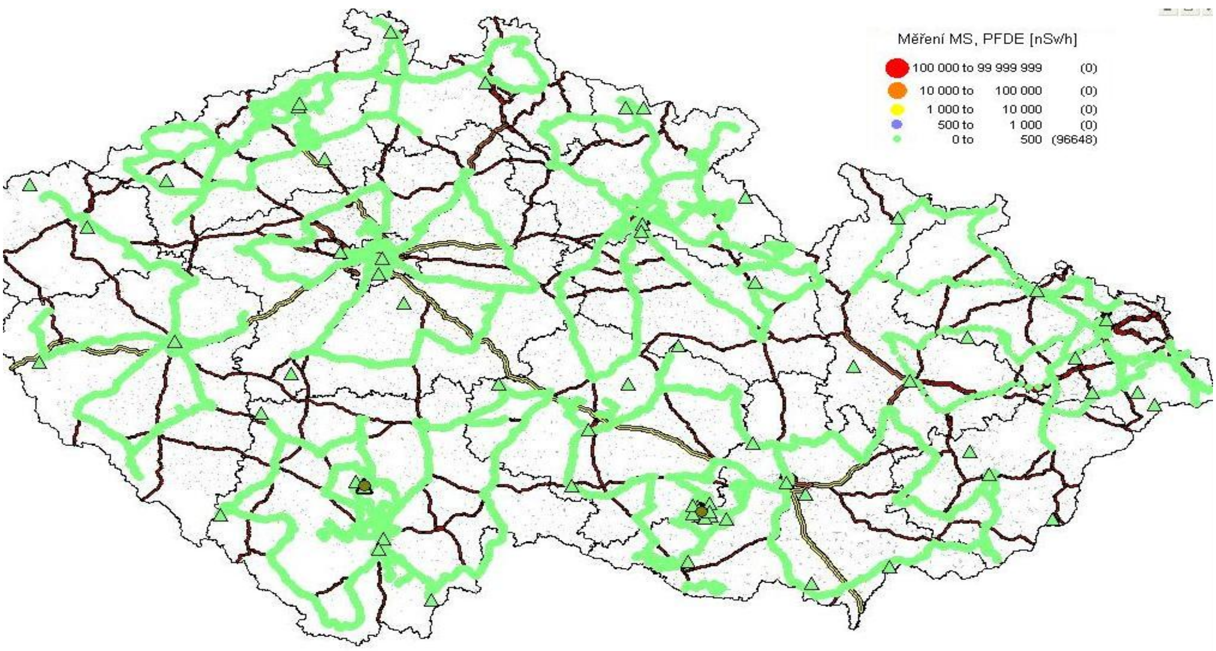


Figure No.6 Air monitoring results within Náměšť nad Oslavou – Moravský Krumlov area (photon dose equivalent rate at 1 m above ground)

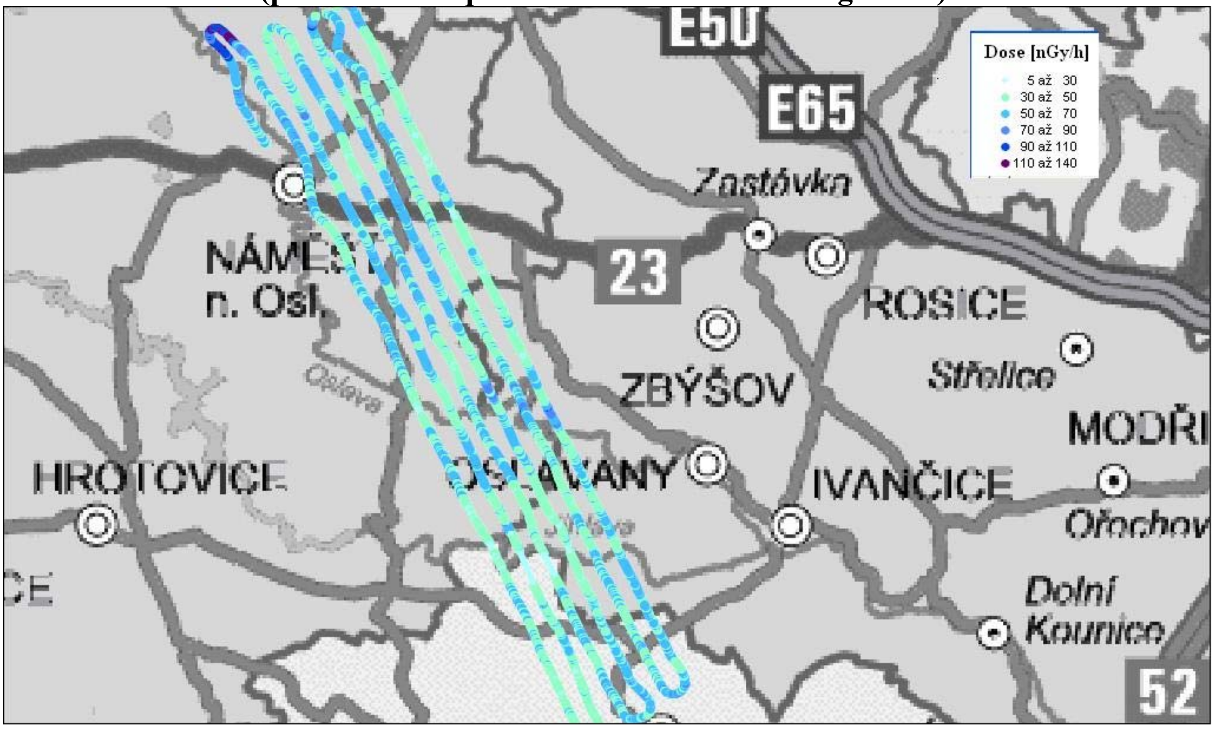


Figure No.7 Location distribution for atmospheric aerosol sampling within RMS ČR

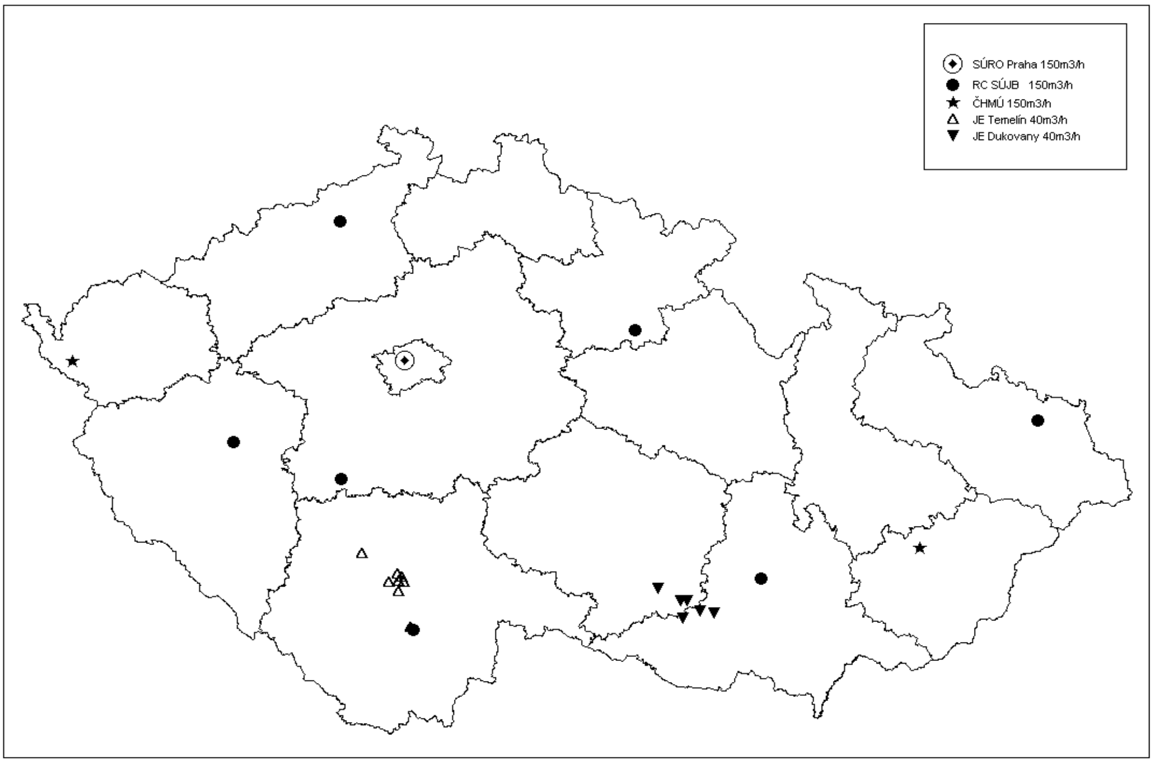


Figure No.8a Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO SÚRO in Prague (sampling and measuring by SÚRO in Prague)

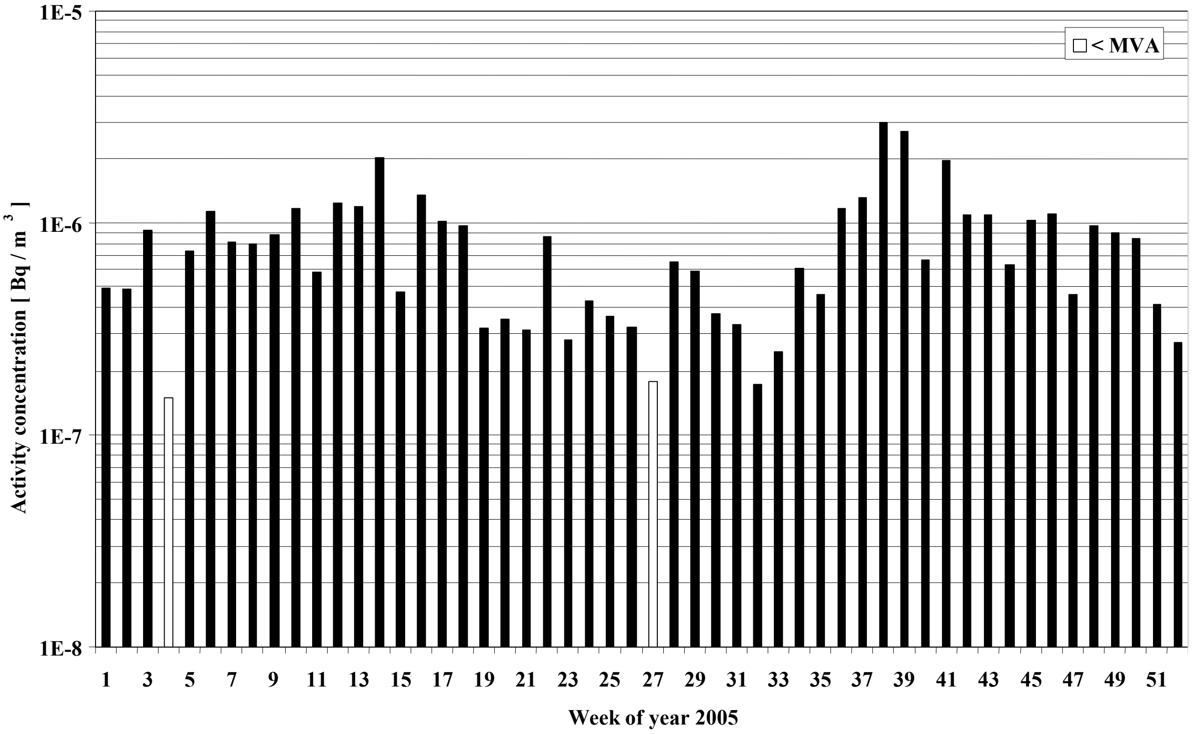


Figure No.8b Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Ústí nad Labem (sampling and measuring by RC in Ústí nad Labem)

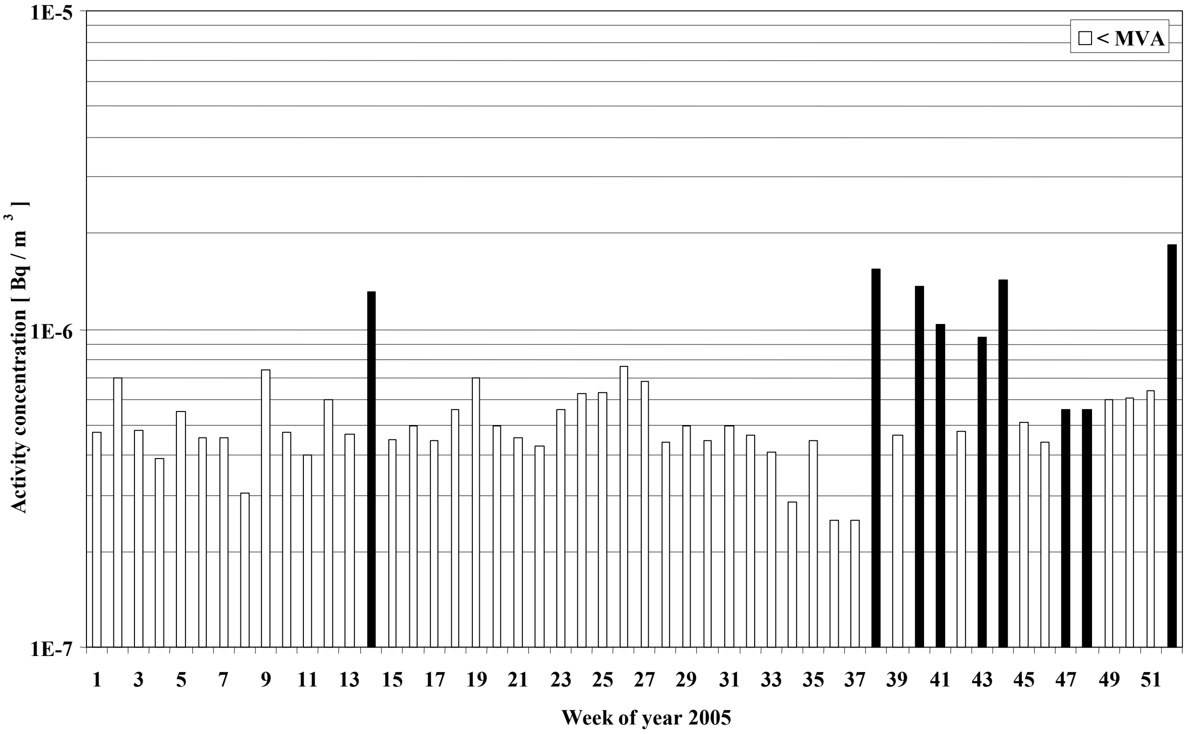


Figure No.8c Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Hradec Králové (sampling and measuring by RC in Hradec Králové)

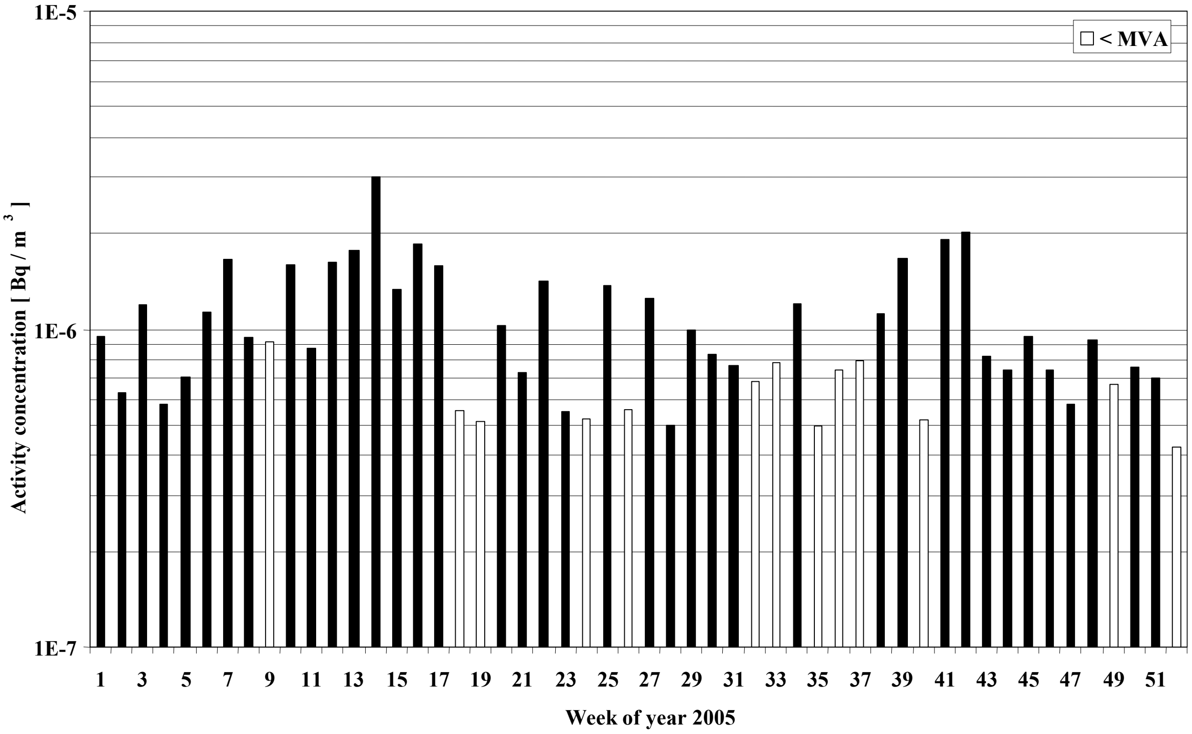
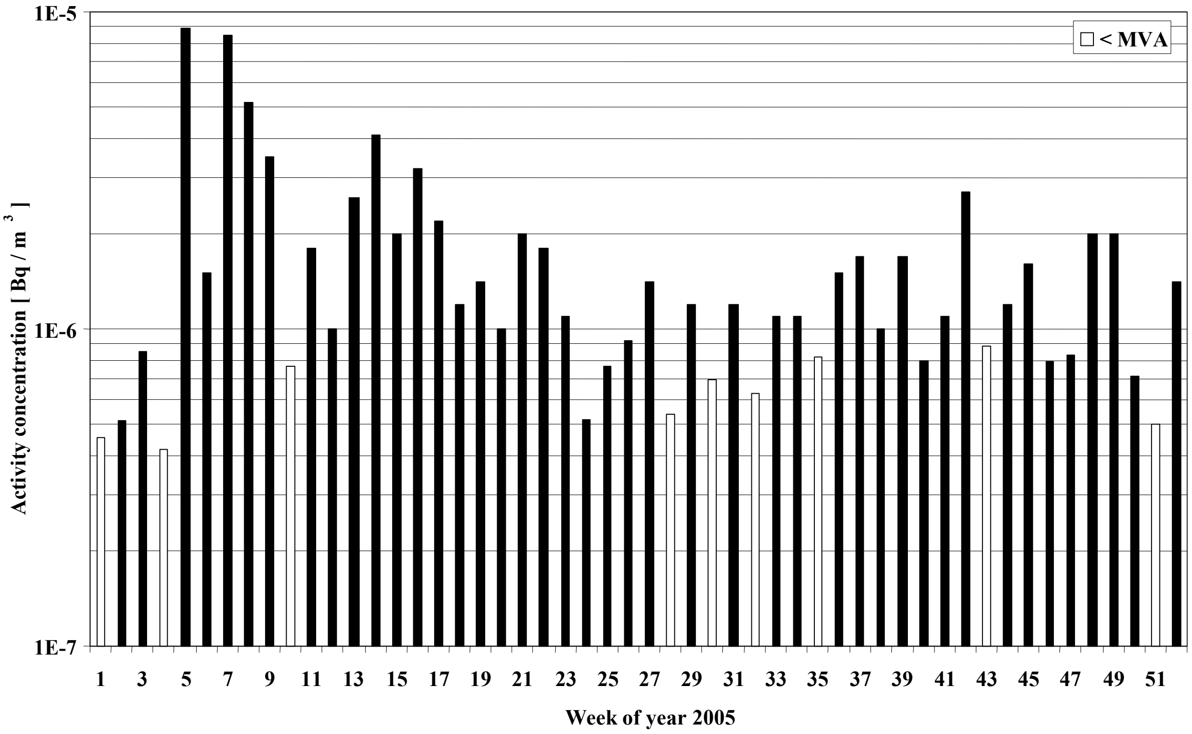


Figure No.8d Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Ostrava (sampling and measuring by SÚRO in Ostrava)



Note: Higher values of ^{137}Cs activity in 5th and 7th week fall inside the limits of values detected in previous years and relate to increased contamination in the region of North Moravia after Chernobyl accident.

Figure No.8e Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in České Budějovice (sampling and measuring by RC in České Budějovice)

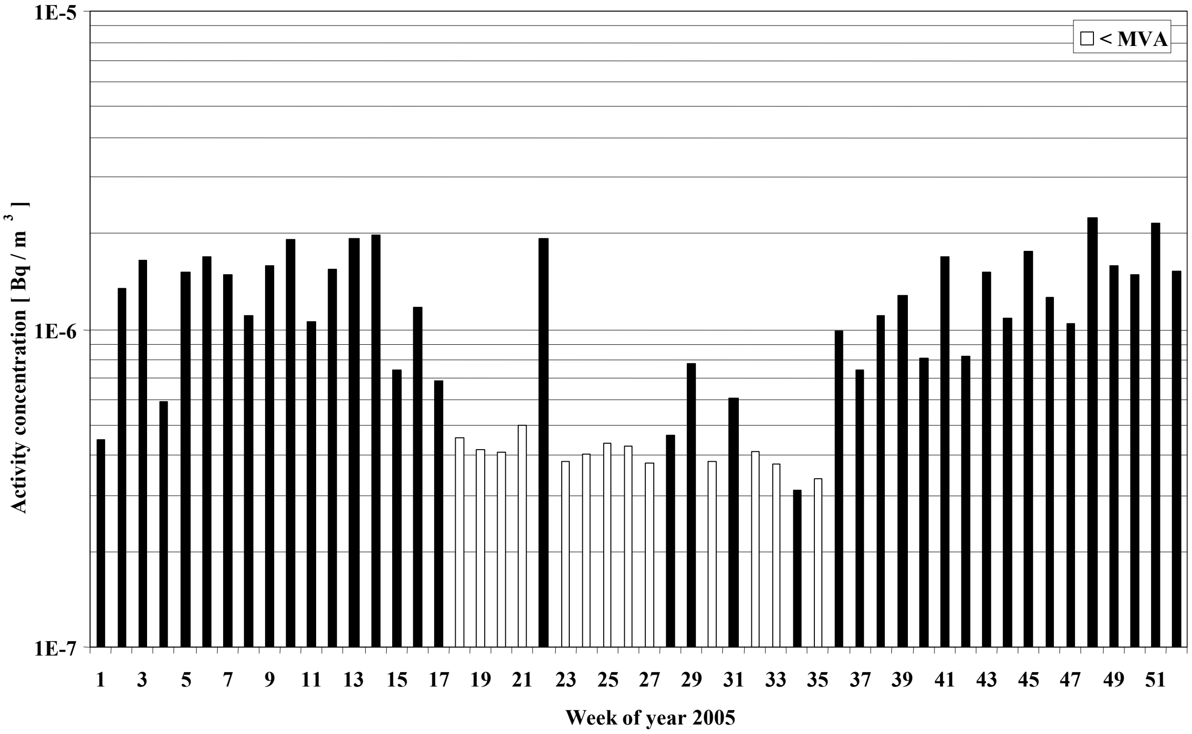


Figure No.8f Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Plzeň (sampling and measuring by RC in Plzeň)

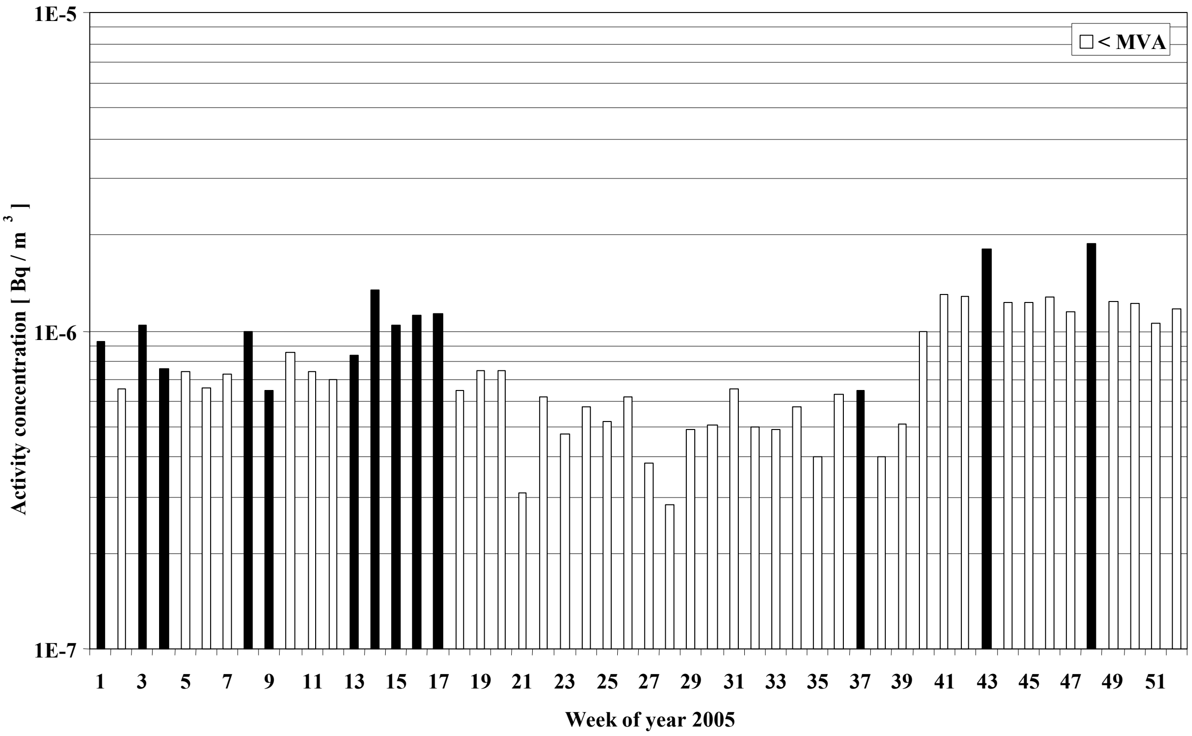


Figure No.8g Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Brno (sampling by RC in Brno, measuring by RC in České Budějovice)

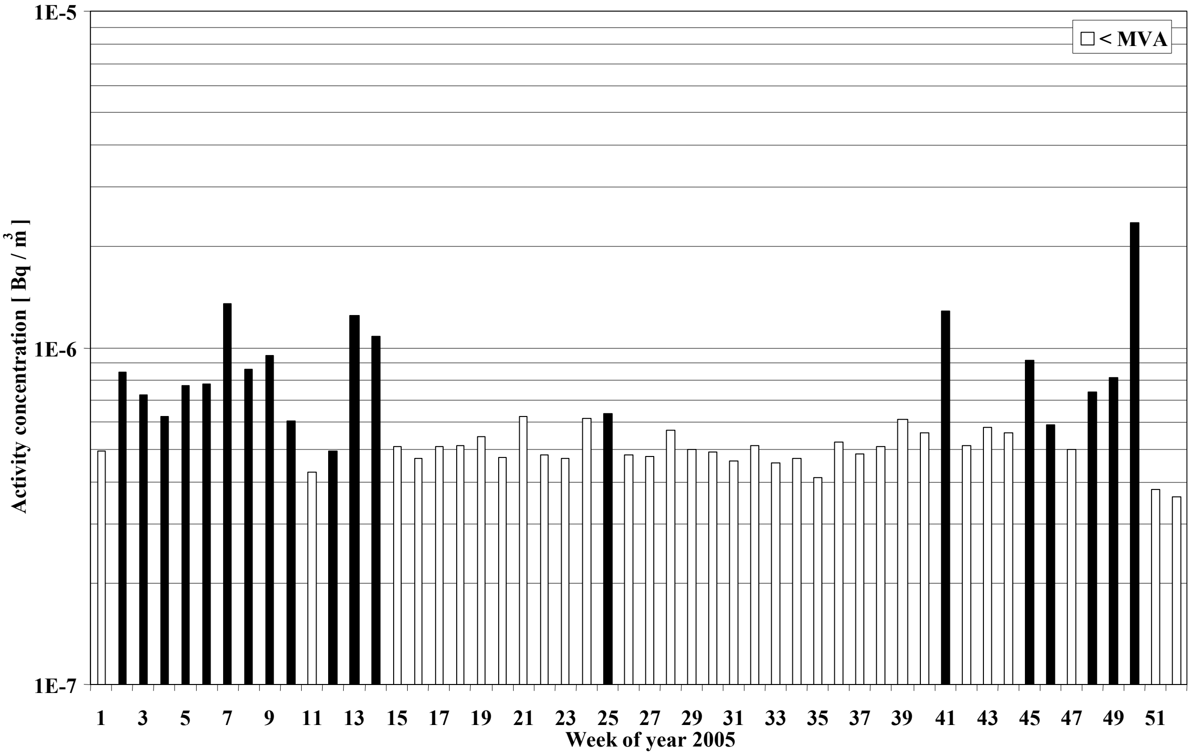


Figure No.8h Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Kamenná (sampling by RC in Kamenná, measuring by SÚJCHBO)

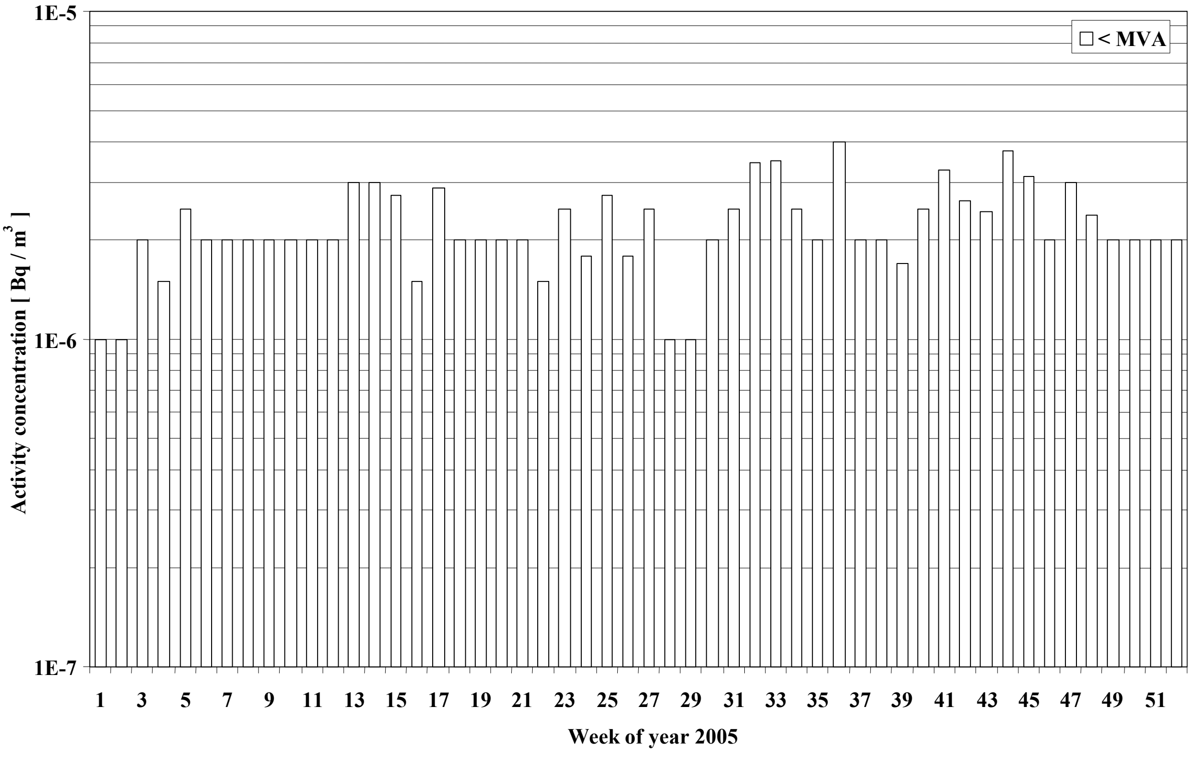


Figure No.8i Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Holešov (sampling by MŽP – ČHMÚ in Holešov, measuring by RC in Ostrava)

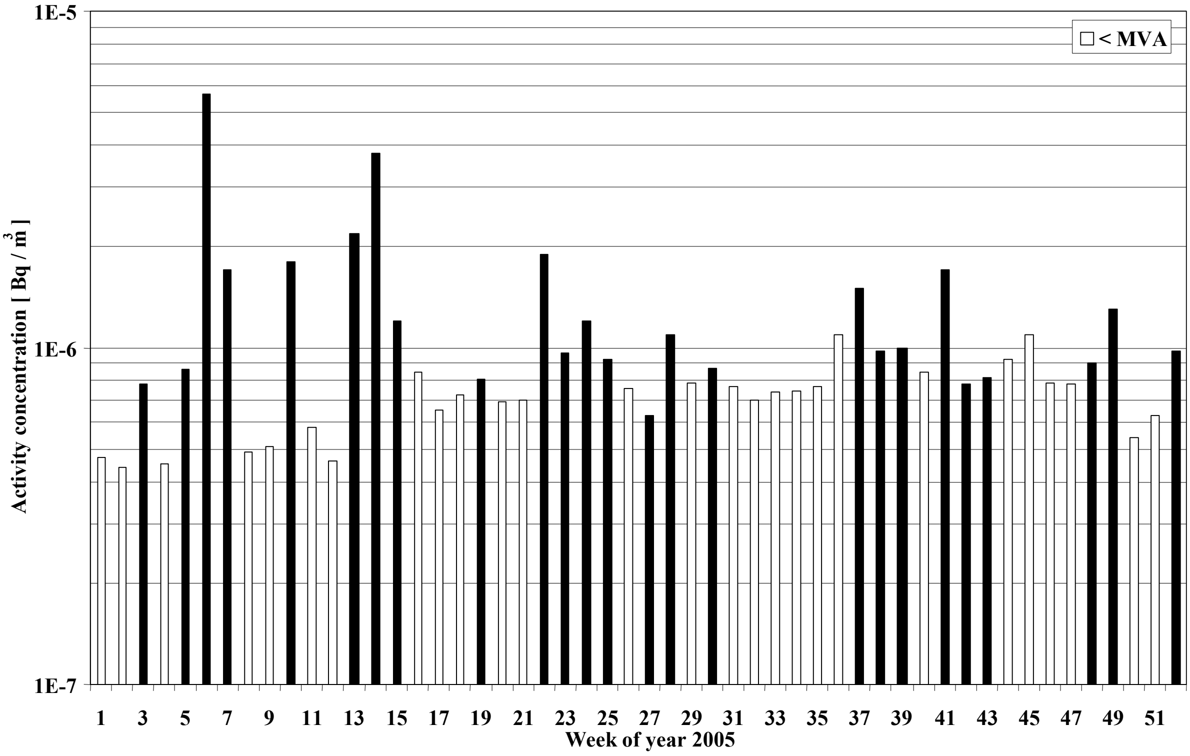


Figure No.8j Activity concentration of ^{137}Cs in aerosol in the air in the year 2005 – MMKO in Cheb (sampling by MŽP – ČHMÚ in Cheb, measuring by SÚRO in Prague)

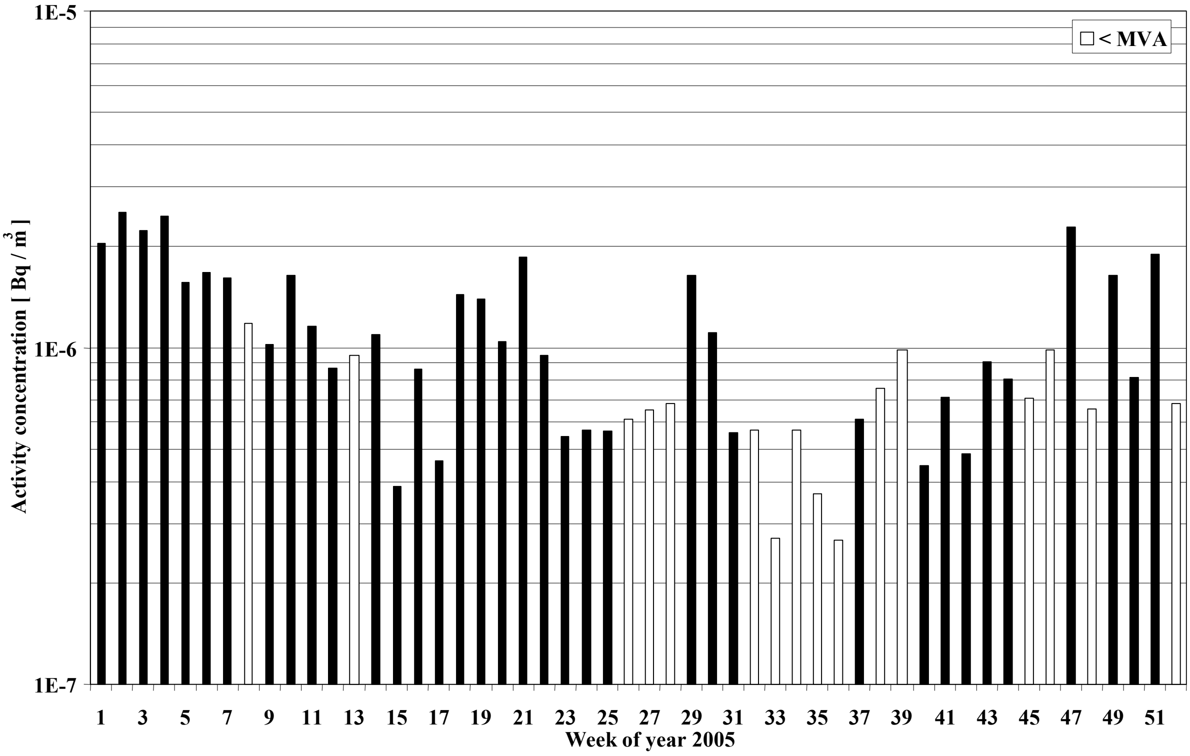


Figure No.9 Activity concentration of selected radionuclides in air aerosol, monthly mean values – MMKO SÚRO in Prague (sampling and measuring by SÚRO in Prague)

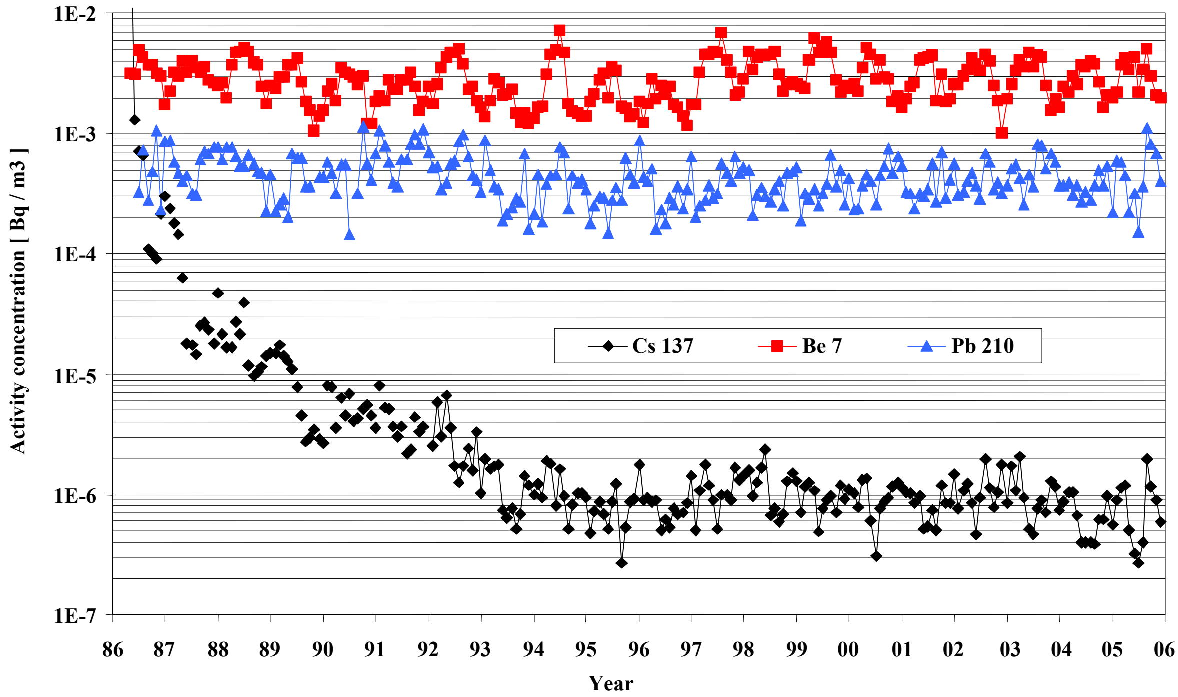


Figure No.10a Activity concentration of ^{85}Kr in the air – MMKO in Prague

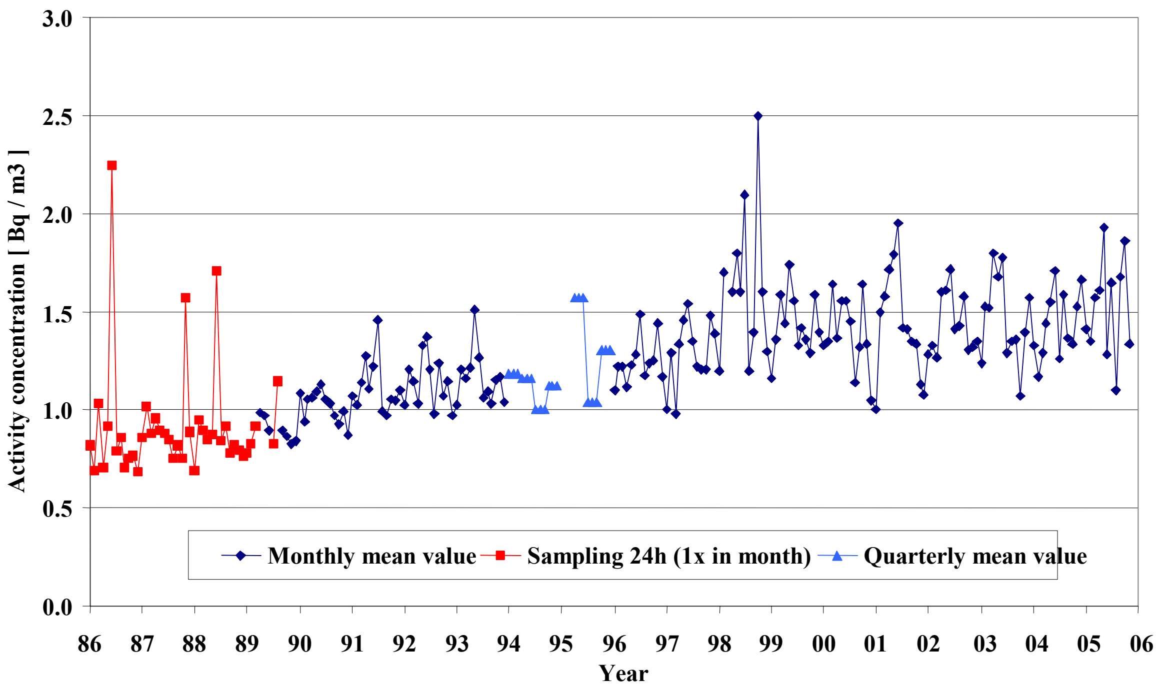


Figure No.10b Activity concentration of ^{14}C in the air in the form of CO_2 – MMKO in Prague

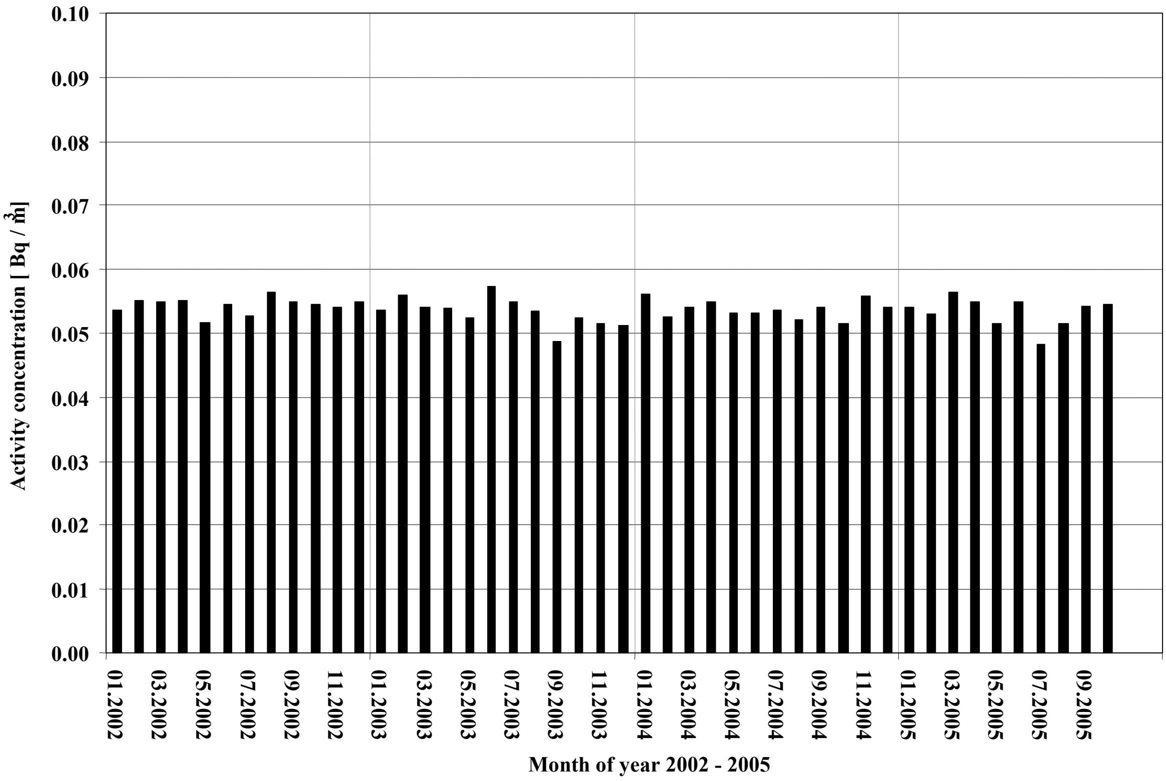


Figure No.11a ^{137}Cs in fallouts in the year 2005 – MMKO in Prague, fallout captured on water surface (sampling and measuring by SÚRO in Prague)

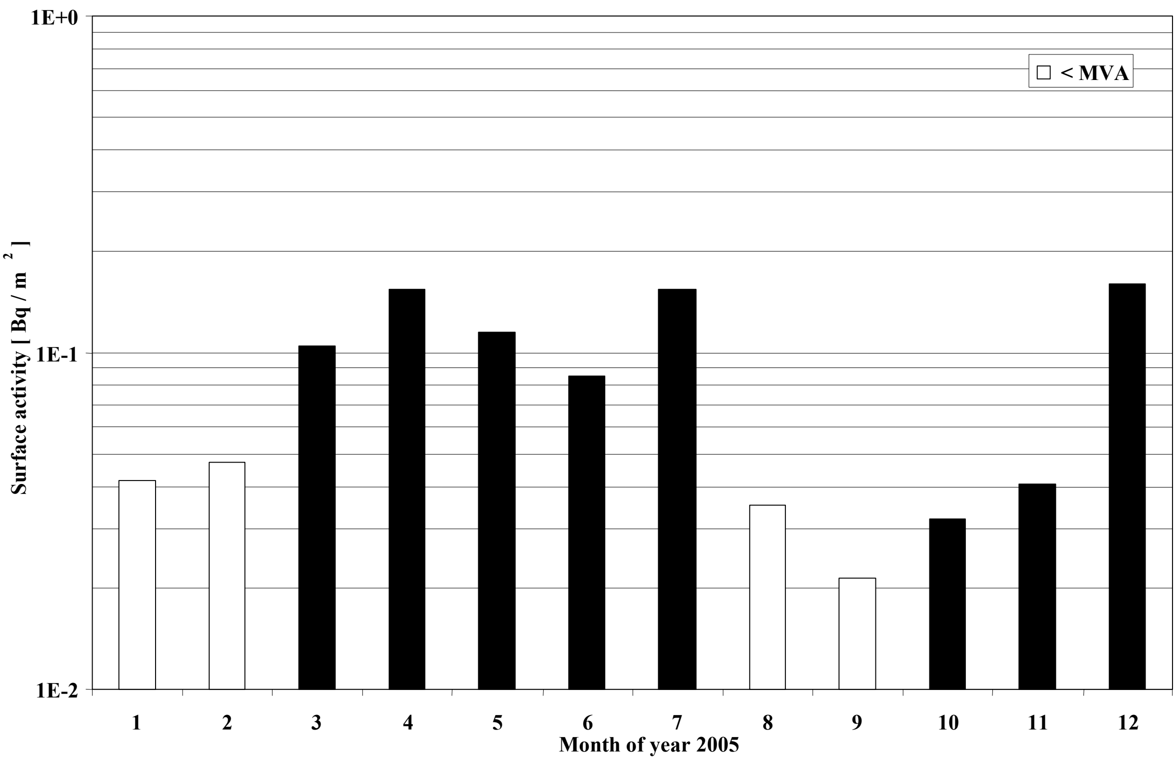


Figure No.11b ^{137}Cs **in fallouts in the year 2005 – MMKO in Ústí nad Labem (sampling and measuring by RC in Ústí nad Labem)**

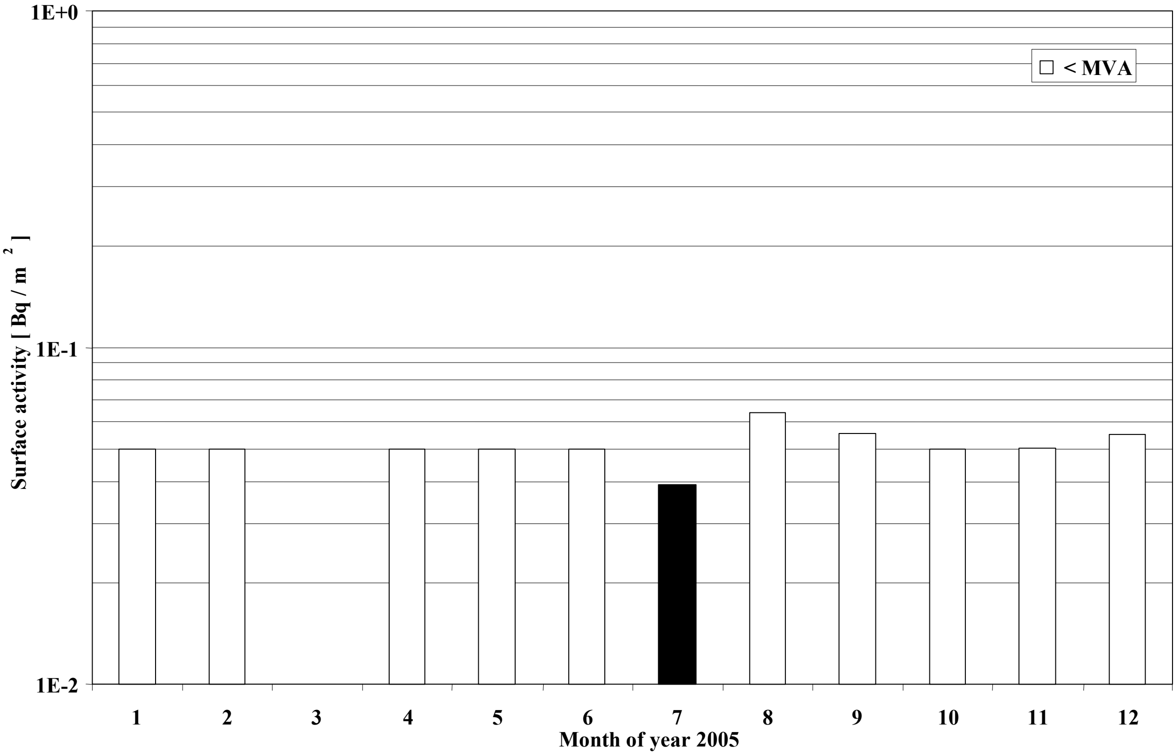


Figure No.11c ^{137}Cs **in fallouts in the year 2005 – MMKO in Hradec Králové (sampling and measuring by RC in Hradec Králové)**

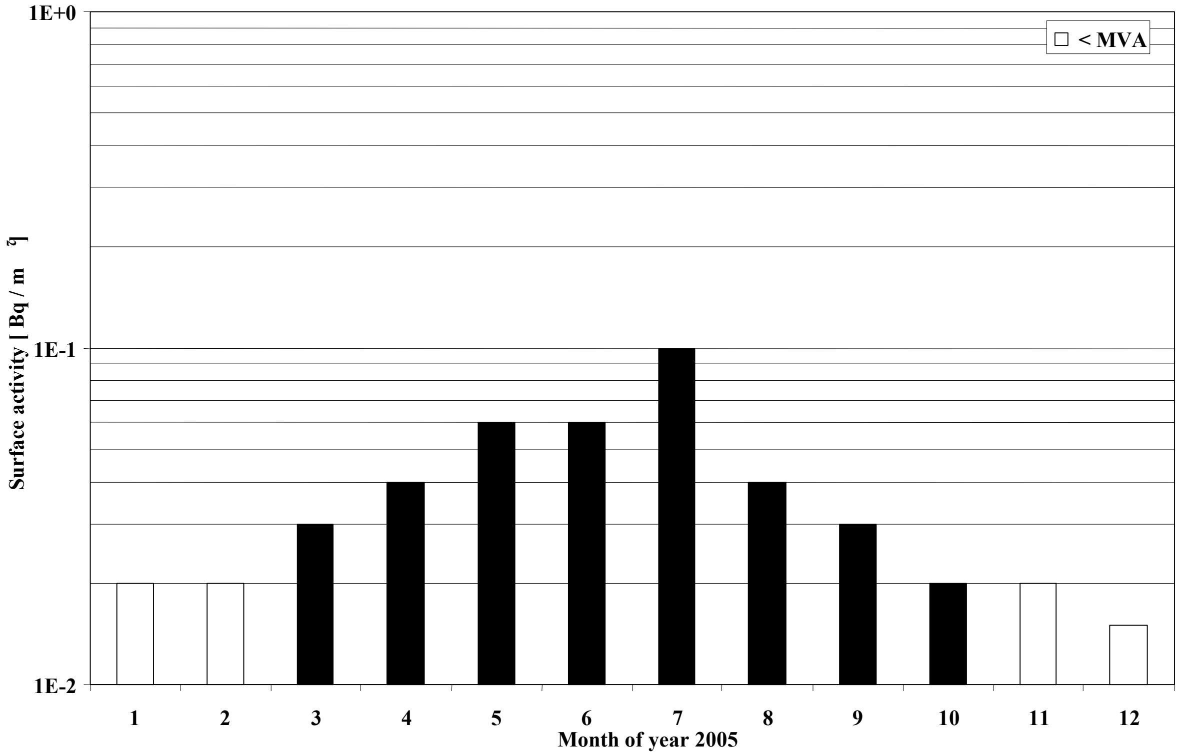


Figure No.11d **^{137}Cs in fallouts in the year 2005 – MMKO in Ostrava (sampling and measuring by SÚRO in Ostrava)**

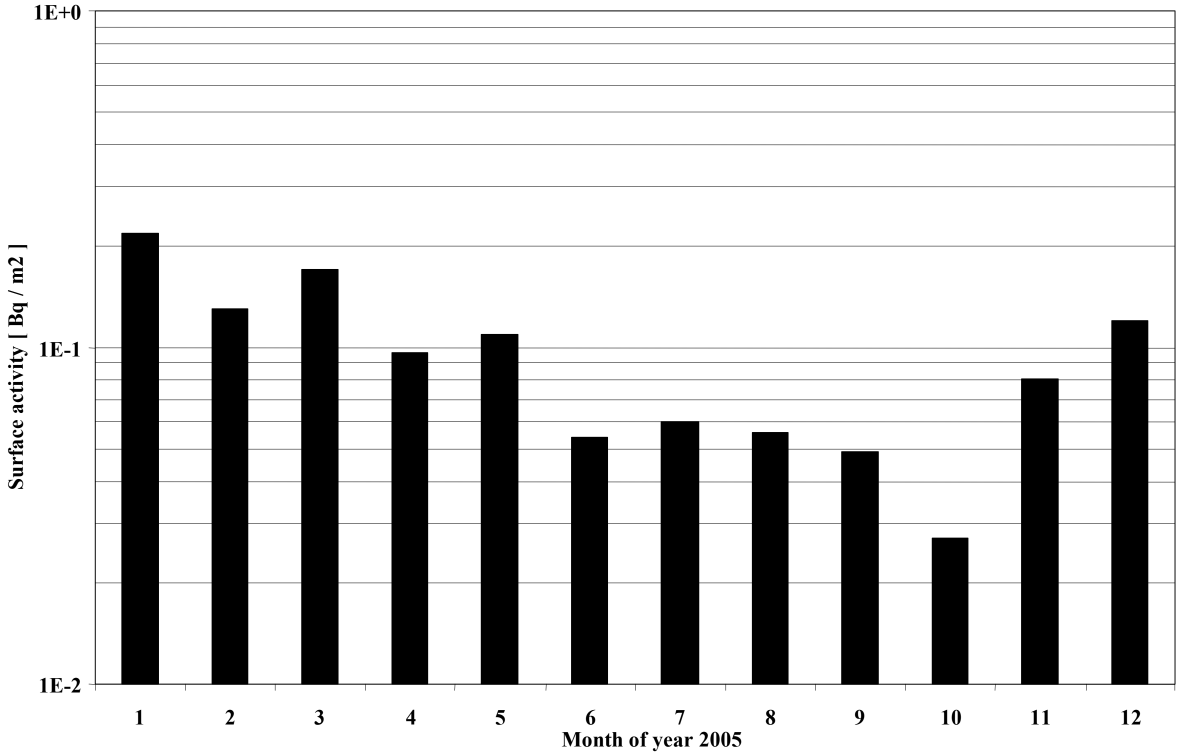


Figure No.11e **^{137}Cs in fallouts in the year 2005 – MMKO in České Budějovice (sampling and measuring by RC in České Budějovice)**

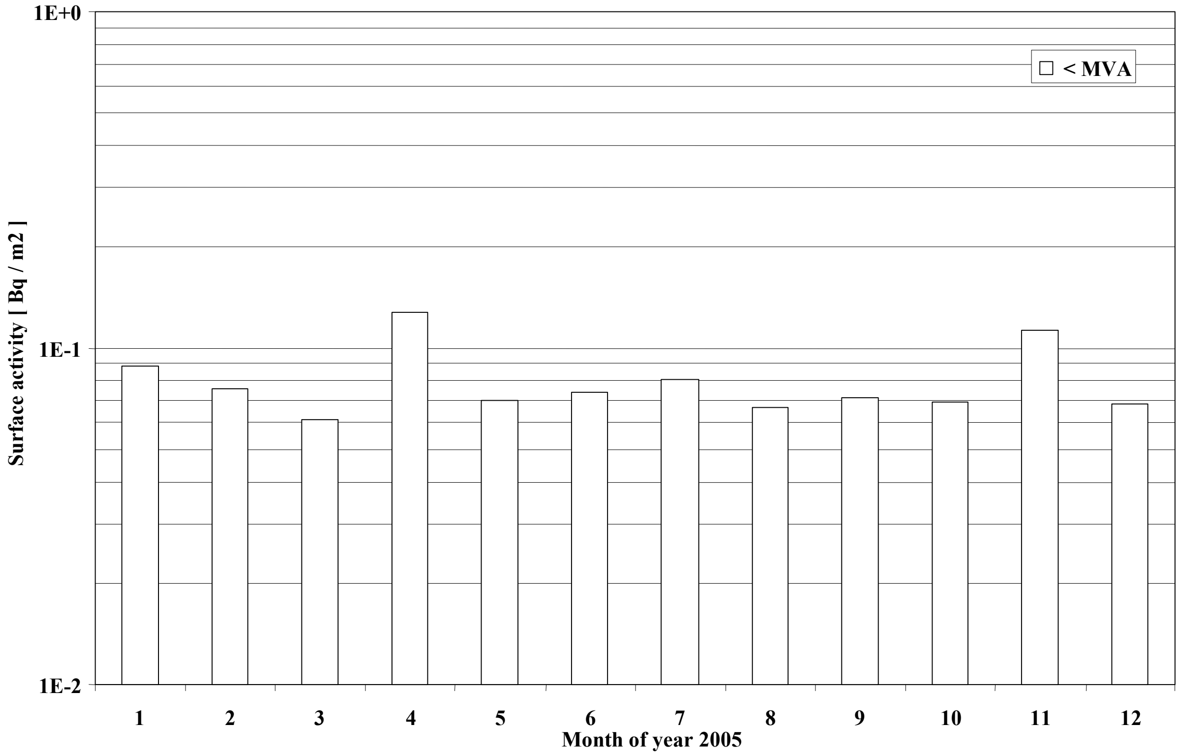


Figure No.11f ^{137}Cs **in fallouts in the year 2005 – MMKO in Plzeň (sampling and measuring by RC in Plzeň)**

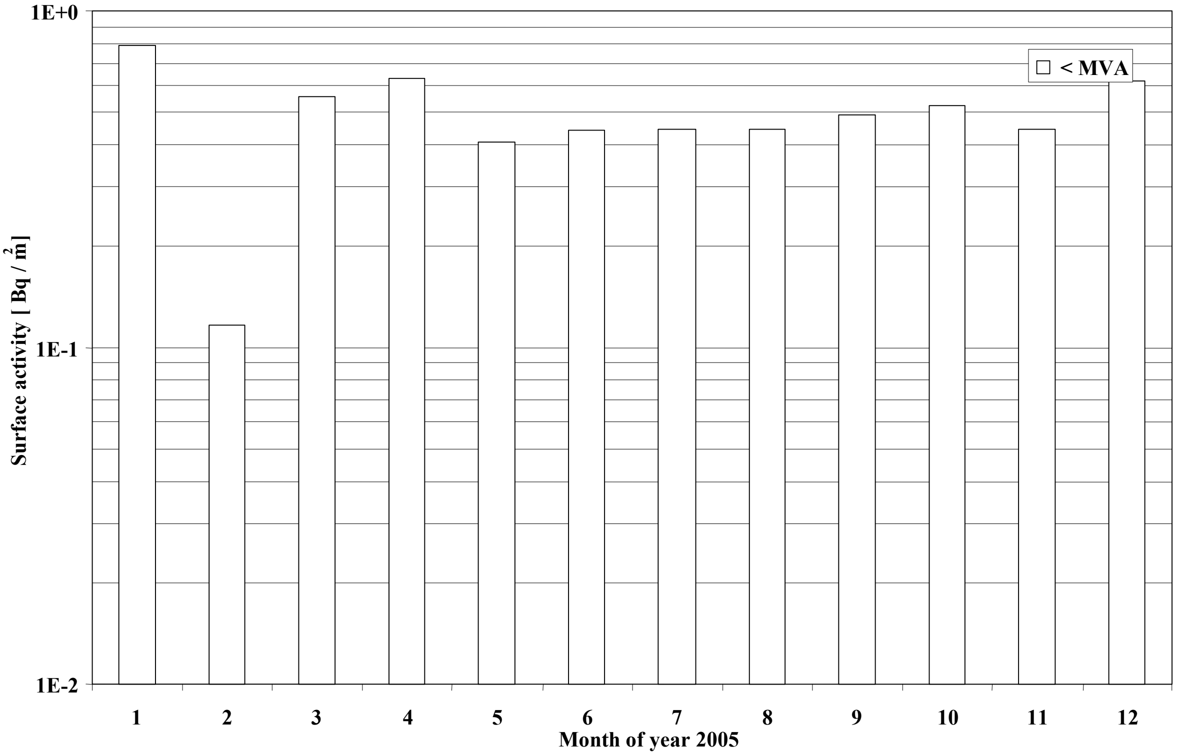


Figure No.11g ^{137}Cs **in fallouts in the year 2005 – MMKO in Brno (sampling by RC in Brno, measuring by RC in České Budějovice)**

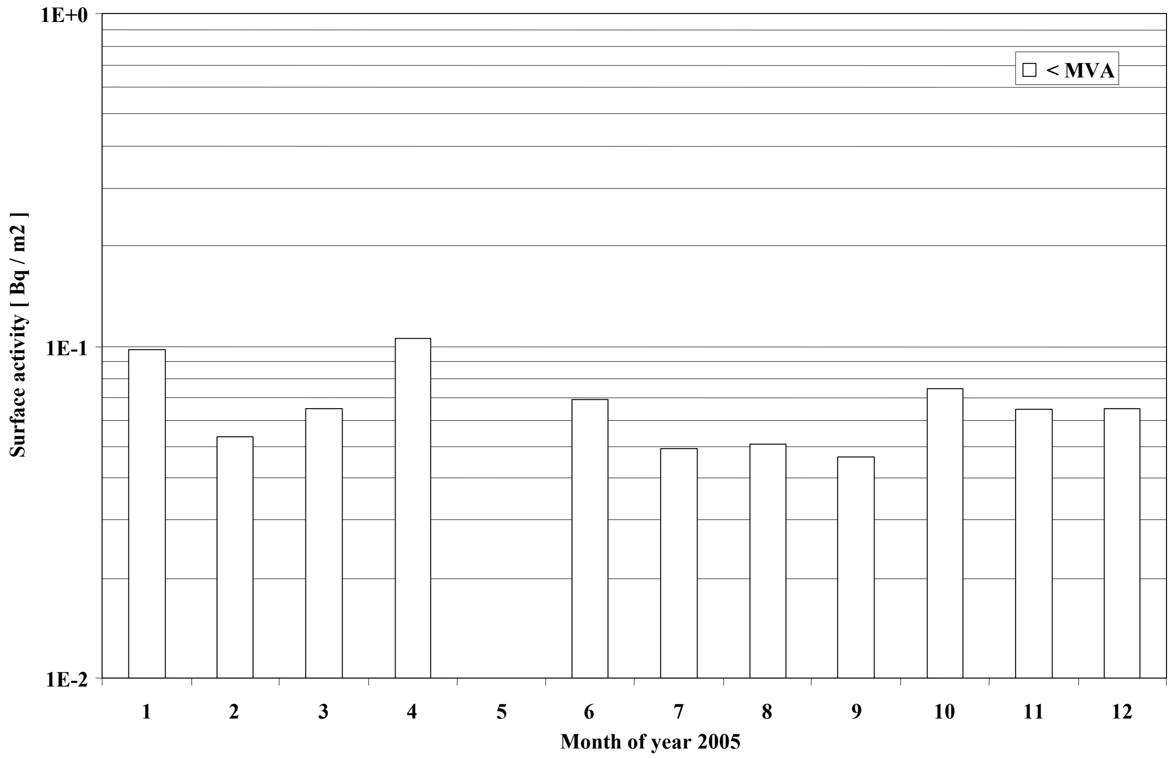


Figure No.11h ^{137}Cs **in fallouts in the year 2005 – MMKO in Kamenná (sampling by RC in Kamenná, measuring by SÚJCHBO)**

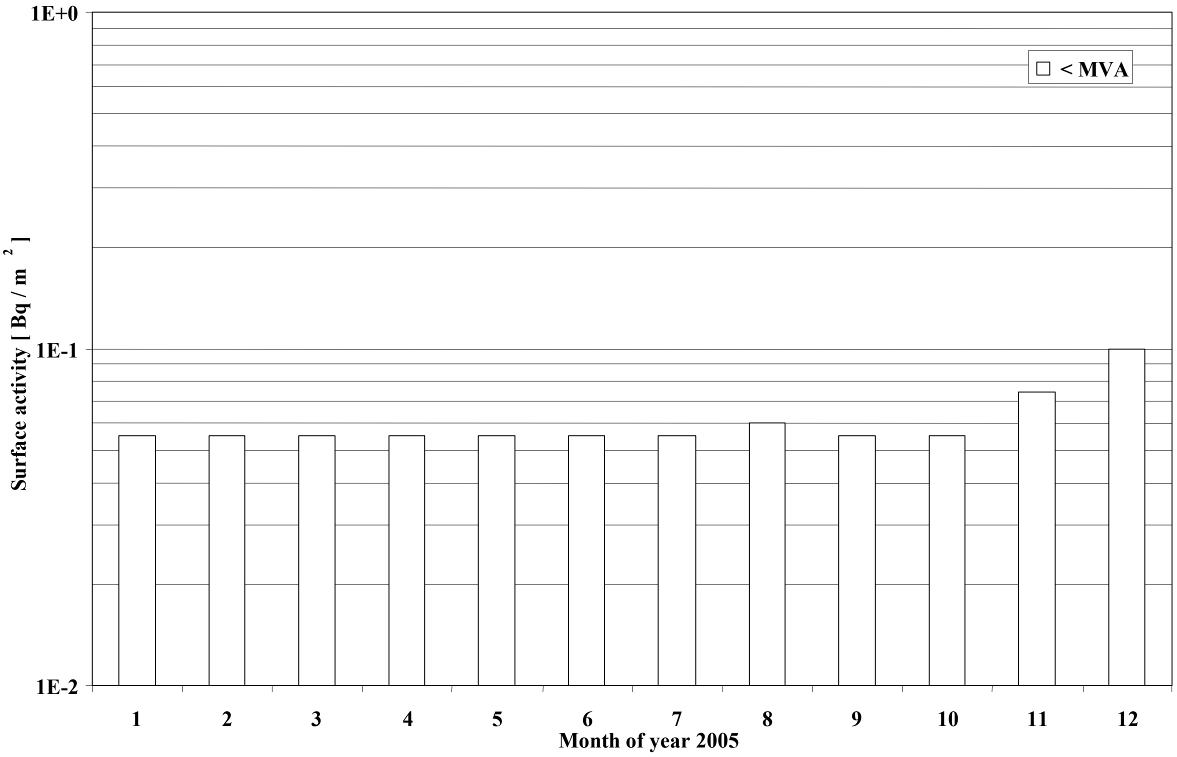


Figure No.12a Surface activity of selected radionuclides in fallouts – MMKO SÚRO in Prague (sampling and measuring by SÚRO in Prague)

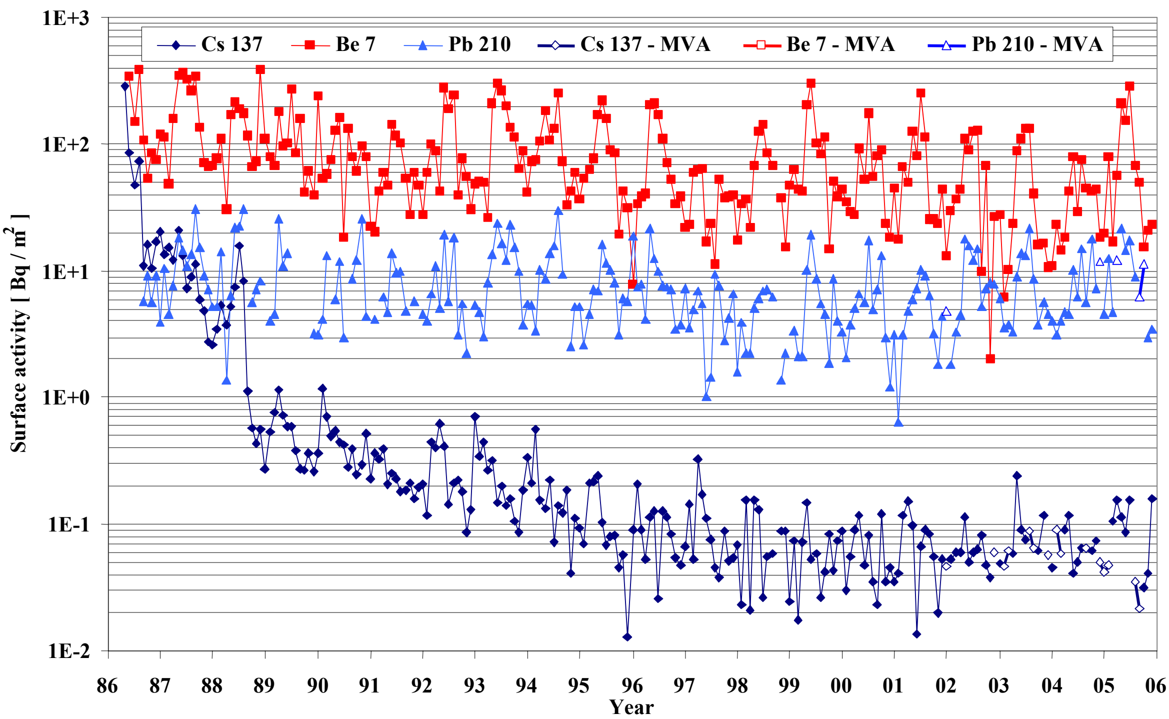


Figure No.12b Activity concentration of ^{3}H in precipitation (sampling and measuring by SÚRO in Prague)

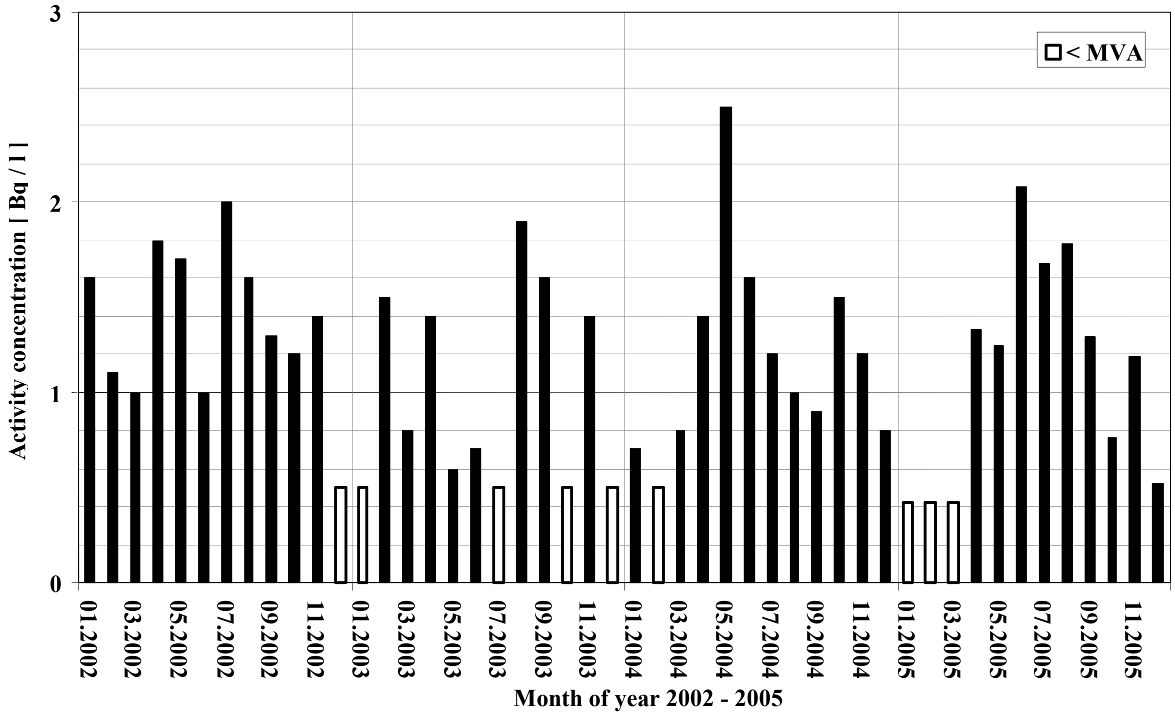


Figure No.13a Activity concentration of ^{3}H in streams in the year 2005 – location selection

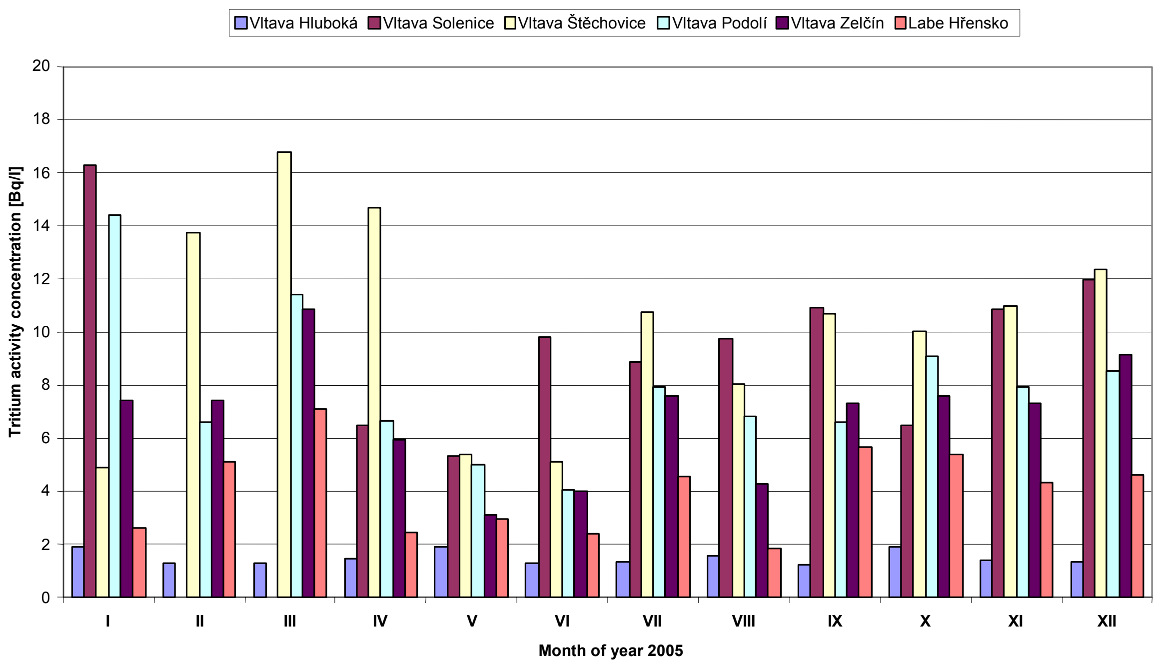


Figure No.13b Activity concentration of ^{3}H in water in the year 205 – location selection

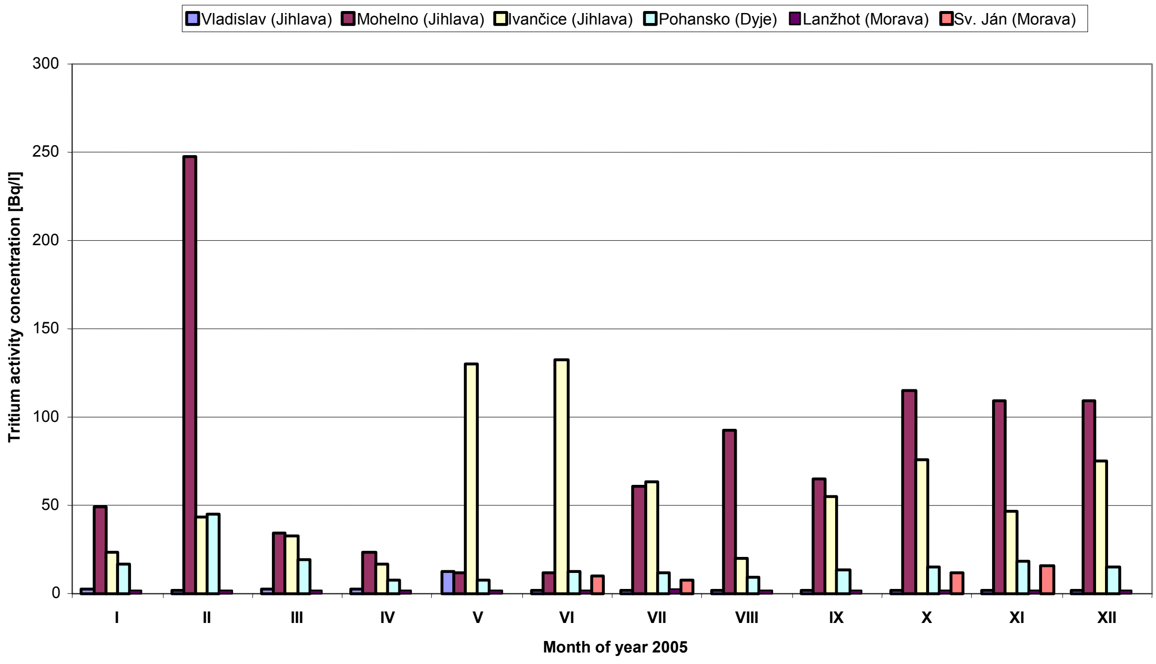


Figure No.13c Activity concentration of ^{3}H in water in the year 2005 – Bohumín (Odra)

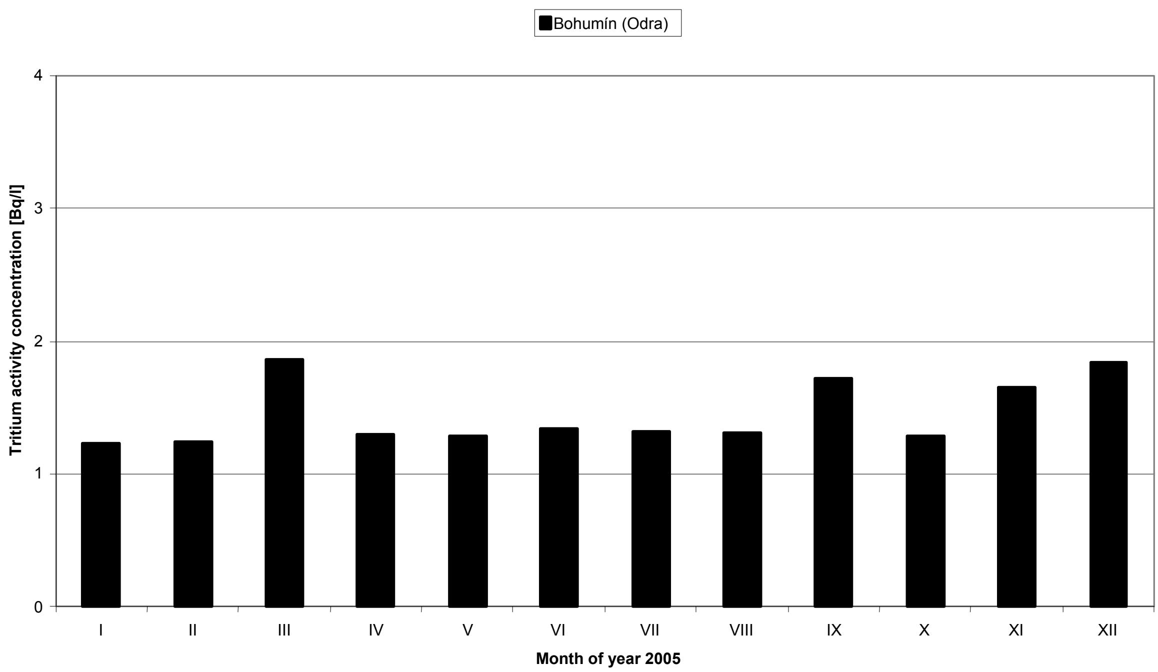


Figure No.14 Annual mean values of ^{137}Cs activity mass in pork and beef and activity concentration in milk from the year 1986 (sampling and measuring until 2003 – SÚJB RC and SÚRO; sampling and measuring from 2004 – RC SÚJB, SÚRO and SVÚ)

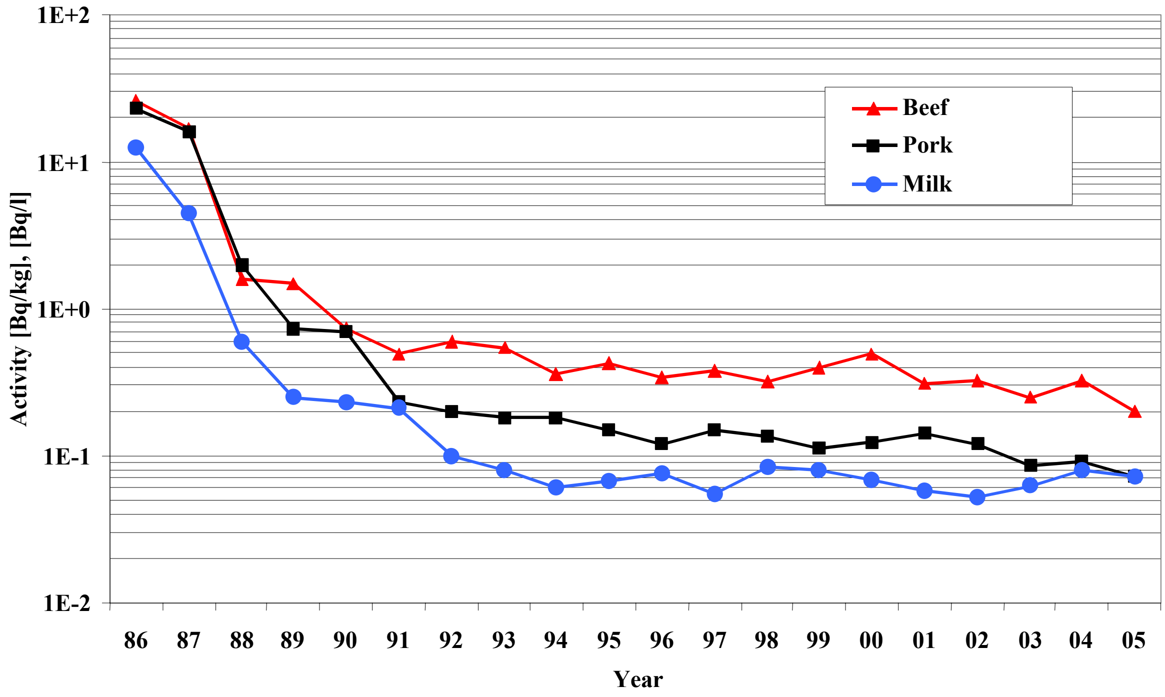


Figure No.15 Development of ^{137}Cs content at Czech population after Chernobyl accident

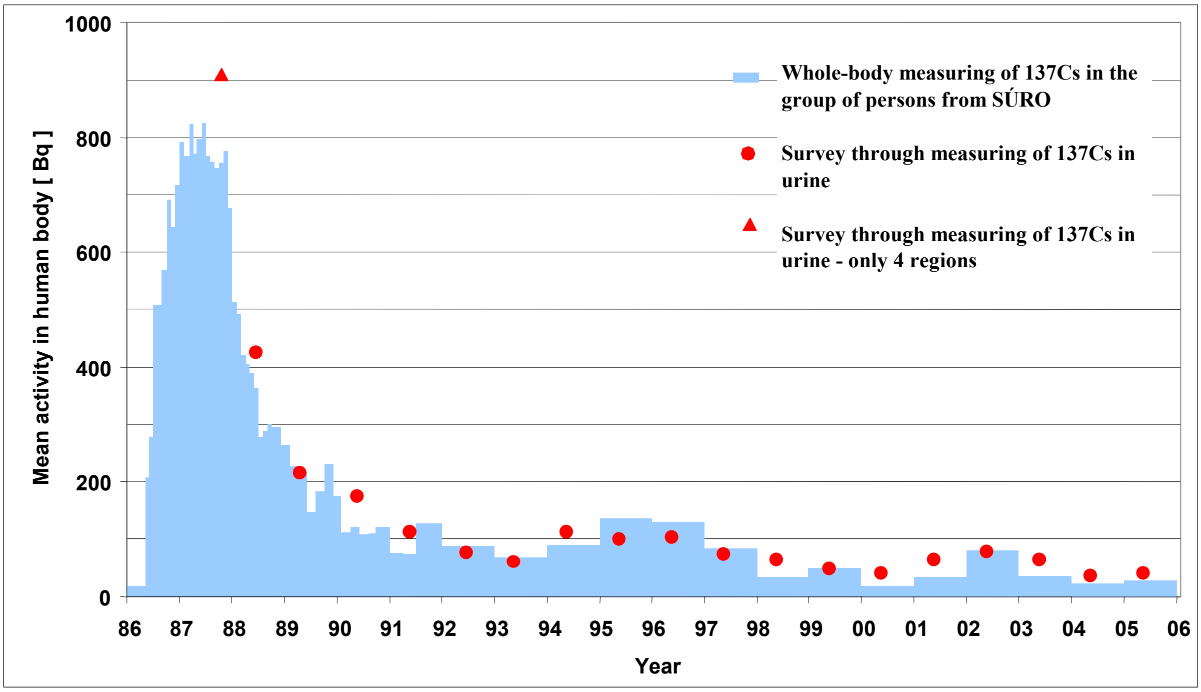


Figure No.16 Total activity of ^{3}H discharged from Dukovany NPP – comparison of values measured by SÚJB and LRKO (sampling by Dukovany NPP, measuring by RC in Brno and LRKO Dukovany NPP)

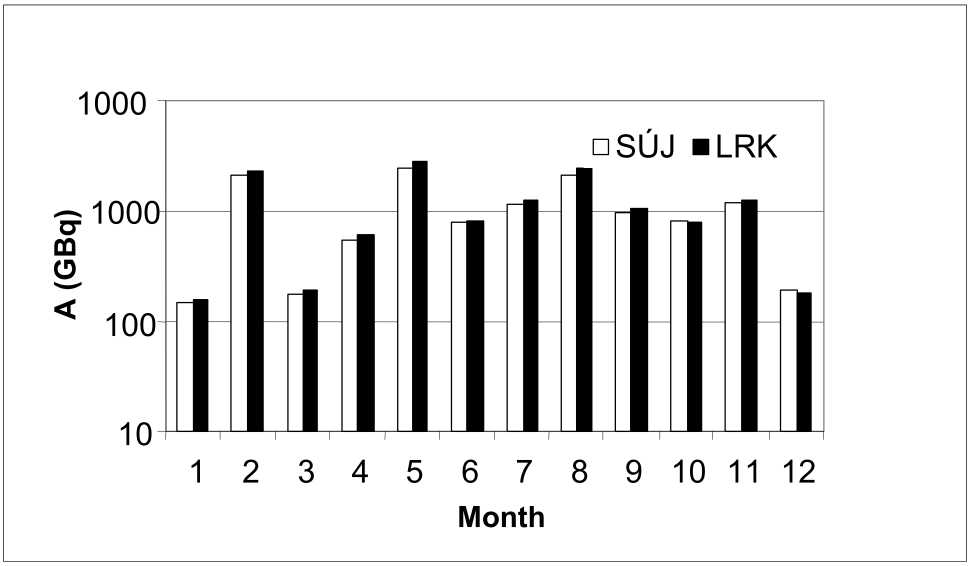


Figure No.17 Total activity of ^{3}H in discharge channel Dukovany NPP – comparison of values measured by SÚJB and LRKO (sampling by Dukovany NPP, measuring by RC in Brno and LRKO Dukovany NPP)

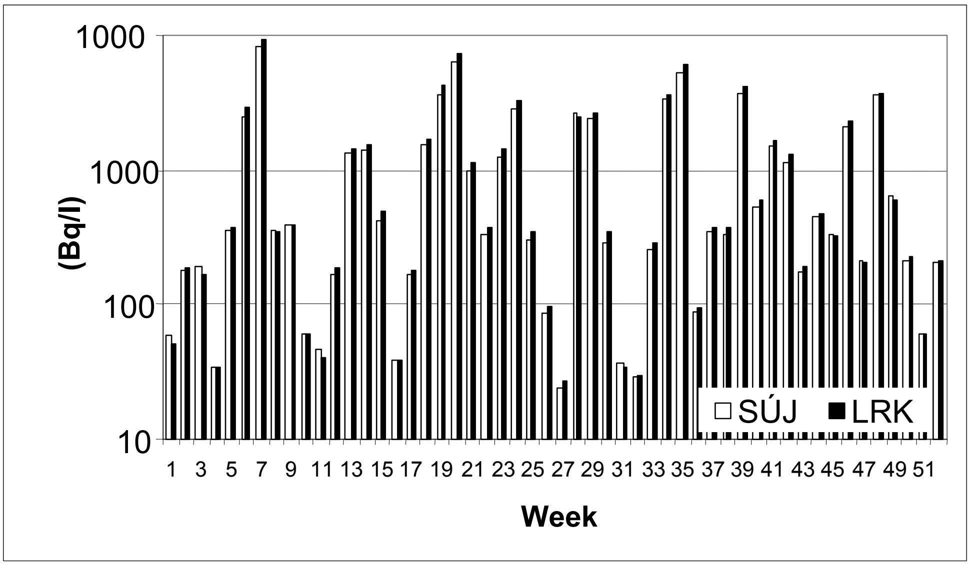


Figure No.18 Total activity of ^3H discharged from Temelín NPP – comparison of values measured by SÚJB and LRKO (sampling by Temelín NPP, measuring by RC in Brno and LRKO Temelín NPP)

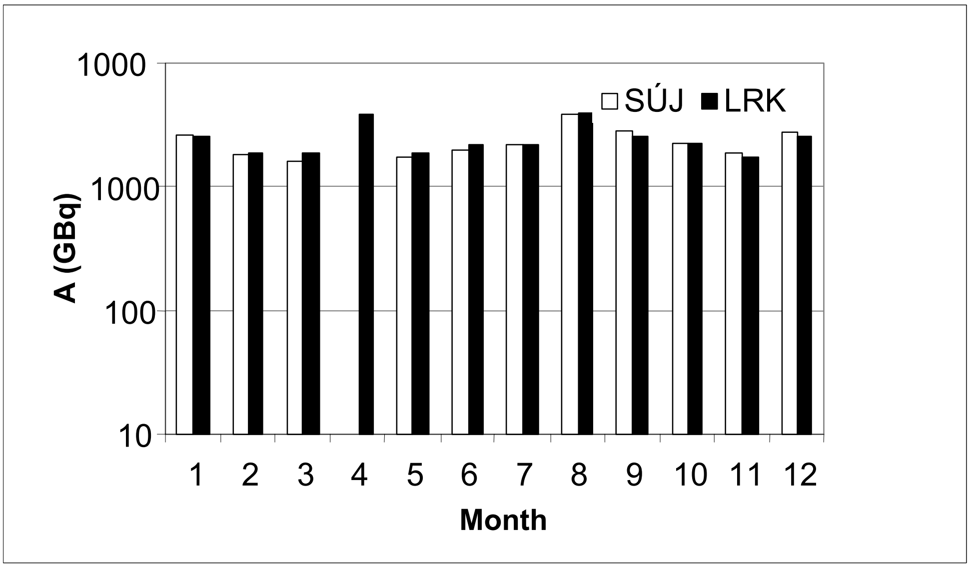


Figure No.19 Activity concentration of ^3H in discharge channel Temelín NPP – comparison of values measured by SÚJB and LRKO (sampling by Temelín NPP, measuring by RC in Brno and LRKO Temelín NPP)

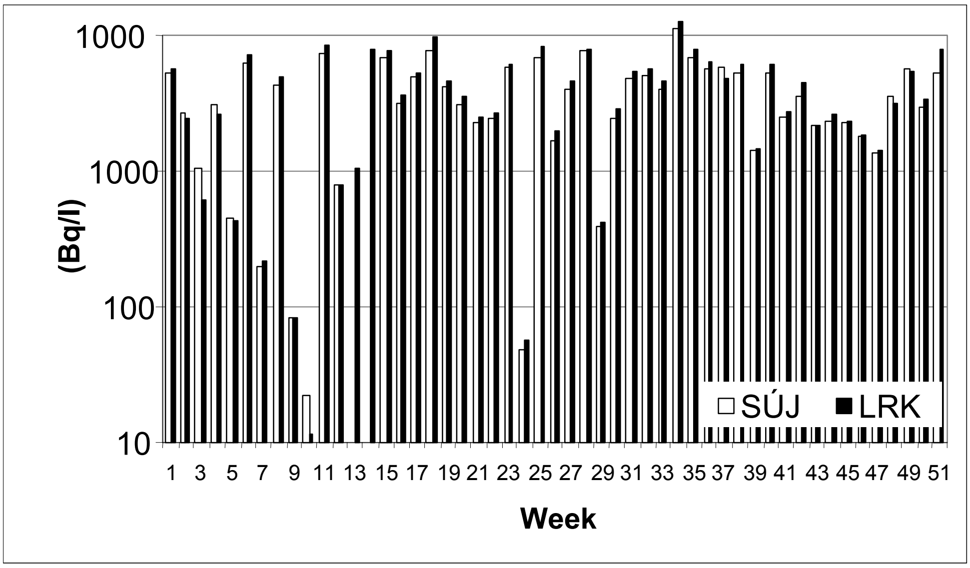


Figure No.20a Gaseous effluent balance – noble gases (^{41}Ar) from sampling in nuclear reactor ventilation stack at the Nuclear Research Institute Řež in the period 1993 - 2005
(Total annual activity limit is 1 000 [TBq])

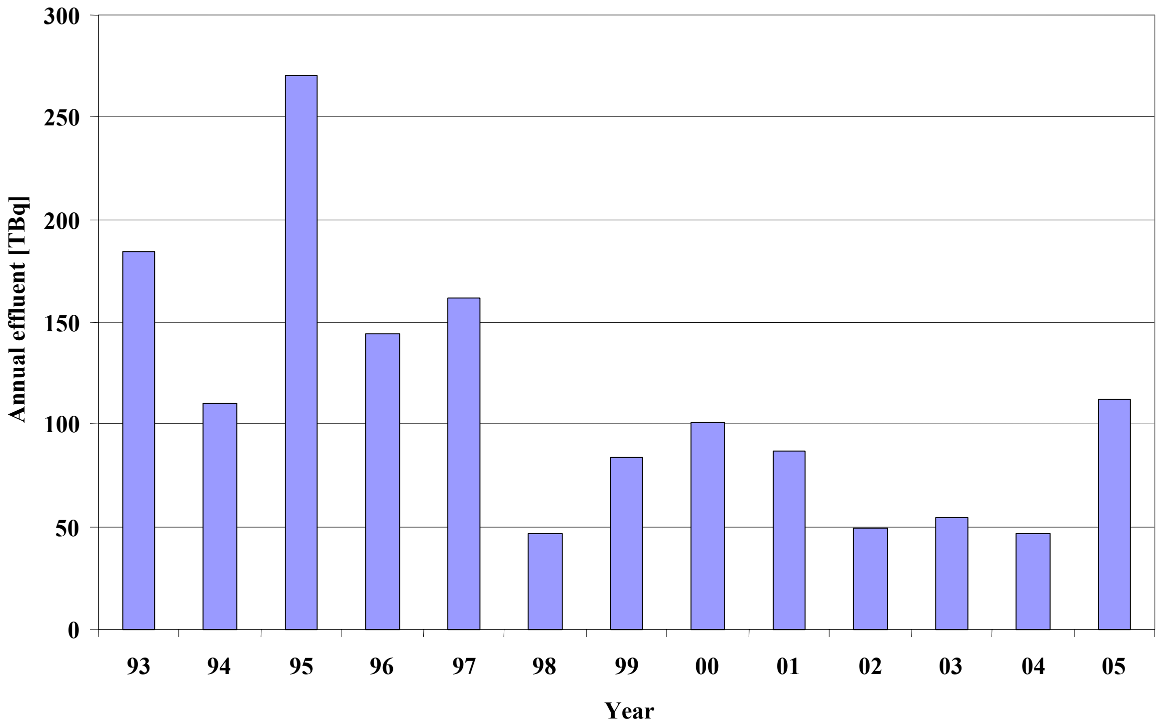


Figure No.20b Gaseous effluent balance – ^{131}I from sampling in nuclear reactor ventilation stack at the Nuclear Research Institute Řež in the period 1993 – 2005
(Total annual activity limit is 20 000 [MBq])

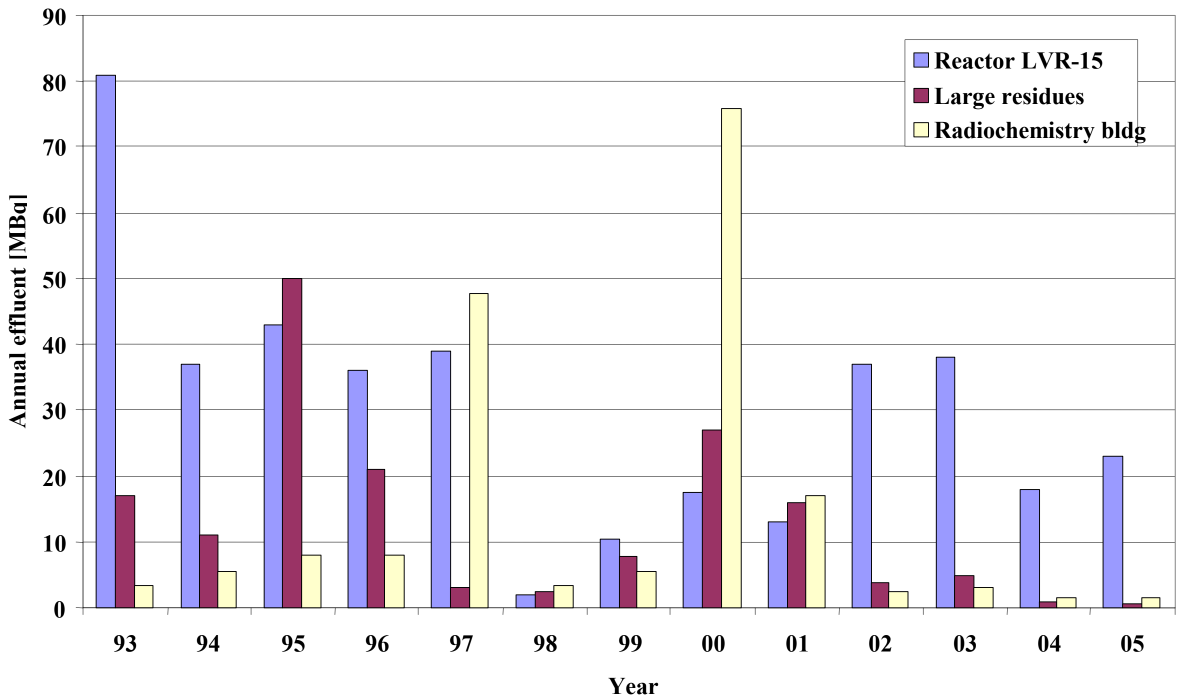


Figure No.20c Liquid effluent balance from sampling in purifying station at the Nuclear Research Institute Řež in the period 1993 – 2005
Total beta activity converted into reference radionuclide 137Cs
(Total annual activity limit is 2 200 [MBq])

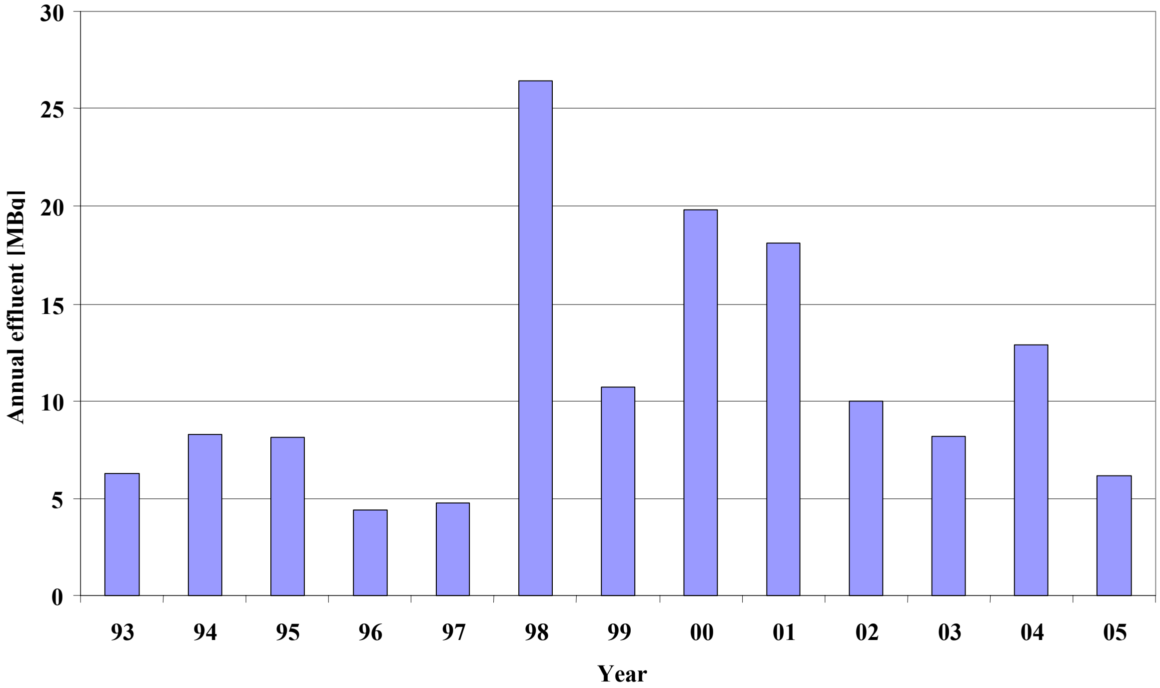


Figure No.21a ^{137}Cs in air aerosol in the year 2005 in the vicinity and on the premises of Dukovany NPP (sampling and measuring by LRKO Dukovany NPP)

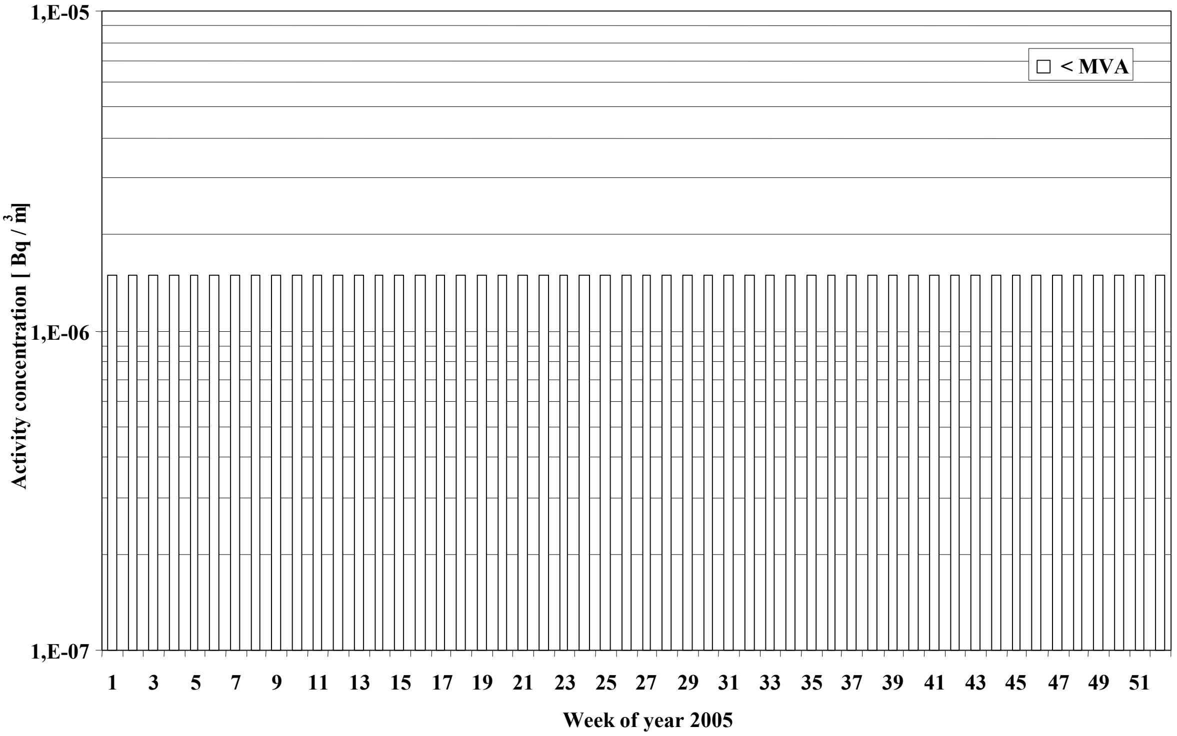


Figure No.21b ^{137}Cs **in air aerosol in the year 2005 in the vicinity of Temelín NPP (sampling and measuring by LRKO Temelín NPP)**

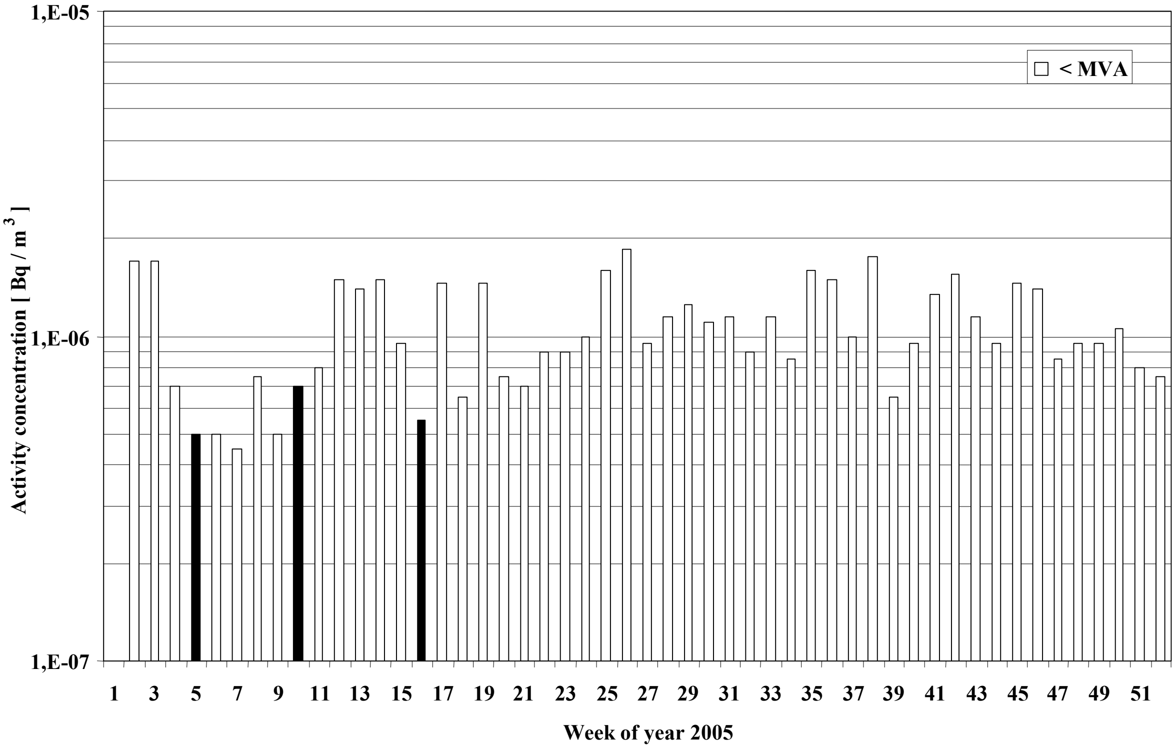


Figure No.21c ^{137}Cs **in air aerosol in the year 2005 on the premises of Temelín NPP (sampling and measuring by LRKO Temelín NPP)**

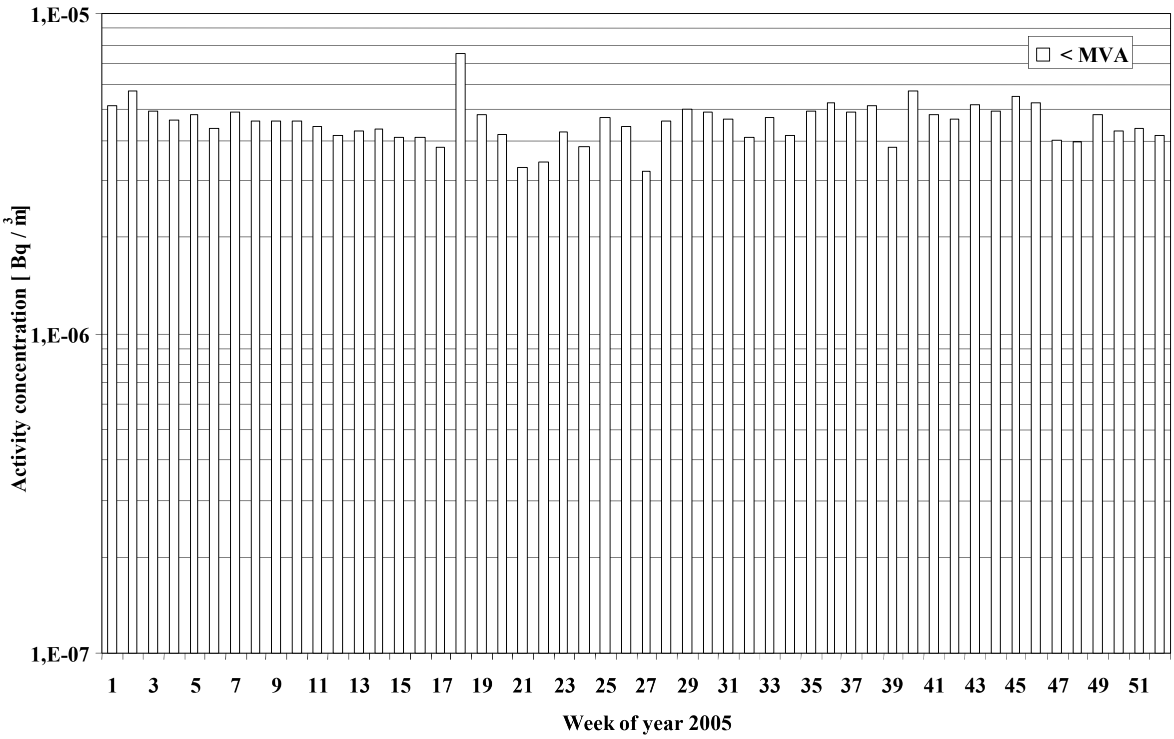


Figure No.22 Activity concentration of ^{3}H in Jihlava river – profile Mohelno and Vltava river – profile Újezd (sampling RC in Brno and České Budějovice, measuring by RC in Brno)

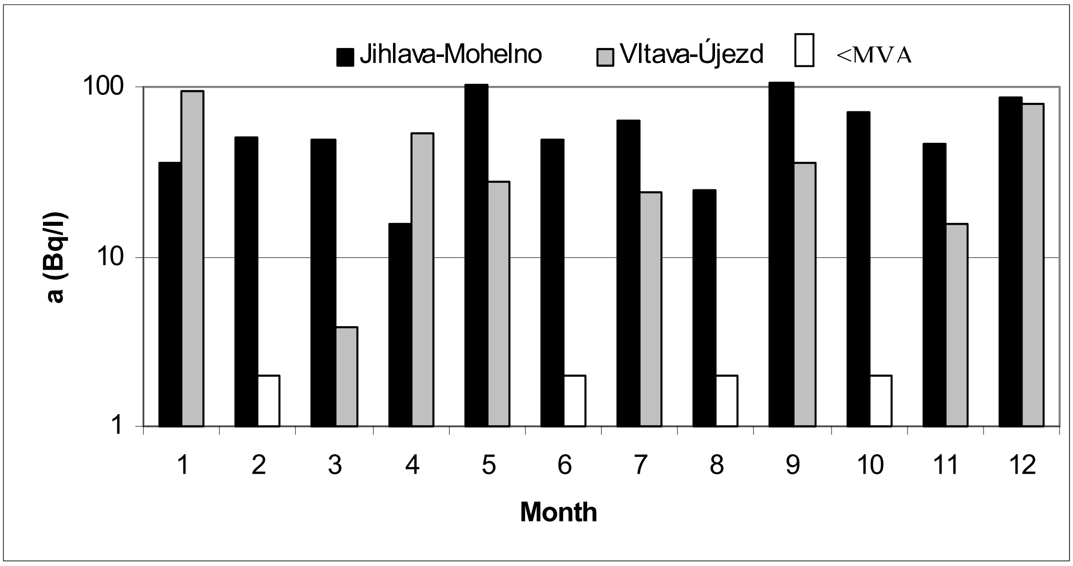


Figure No.23 Surface activity of ^{137}Cs in fallouts in the vicinity of Dukovany NPP (sampling by RC in Brno, measuring by RC in České Budějovice)

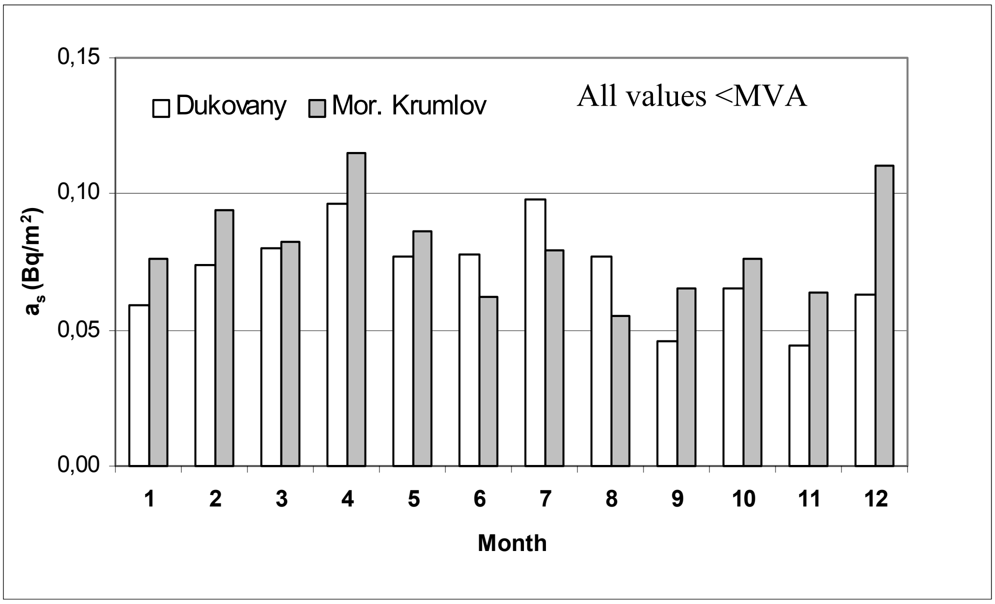


Figure No.24 Surface activity of ^{137}Cs in fallouts in the vicinity of Temelín NPP – quarterly values in individual locations (sampling and measuring by RC in České Budějovice)