

DATA PROCESSING IN THE AUTHORIZED ENVIRONMENTAL RADIATION PROTECTION SYSTEM
OF THE NUCLEAR PLANT, PAKS

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An off-line computer system has been developed to collect and process the measured data of the governmental laboratories involved in the environmental control of emissions of radioactive substances from the Hungarian nuclear plant.

A common data sheet is used to prepare the data of sampling/date, site, object, etc./ and radioactivity measurement/nuclide, activity, etc./. Data processings are regularly performed monthly, quarterly, half yearly and yearly. The computer output related to the atmospheric and liquid releases from the nuclear facility and concentrations in the surface waters, soil, milk, etc. contains the minimum, maximum and the mean values during the given period.

The results are presented to the base institutes of the supervisory authorities. There were collected more than 50,000 data from the beginning of 1983.

Introduction

In Hungary as well as in most countries the control of the environment around the nuclear facilities is to be fulfilled mainly by the facilities themselves. The authorities - in addition to the controlling of the radiation protection activities of the facilities - have to carry out independent measurements indoor and outdoor as well.

The duties of the authorized environmental radioprotection system in Hungary are shared among the National Authorities of

Environmental and Natural Protection Authority,
Ministry of Agriculture and Foods,
Ministry of Health,
National Authority of the Waters.

The special work of the authorities is directed by the so-called basic institutes. They plan the monitoring programmes of their own laboratories in agreement with other authorities and also they appreciate the operational state of the nuclear power station with respect to the radiation protection.

To collect and process the data of the laboratories involved in the environmental control the National Authorities have agreed to establish a common computer center in the basic institute of the Ministry of Health, in the National Research Institute for Radiobiology and Radiohygiene.

The computer specialists together with the radiological experts of the

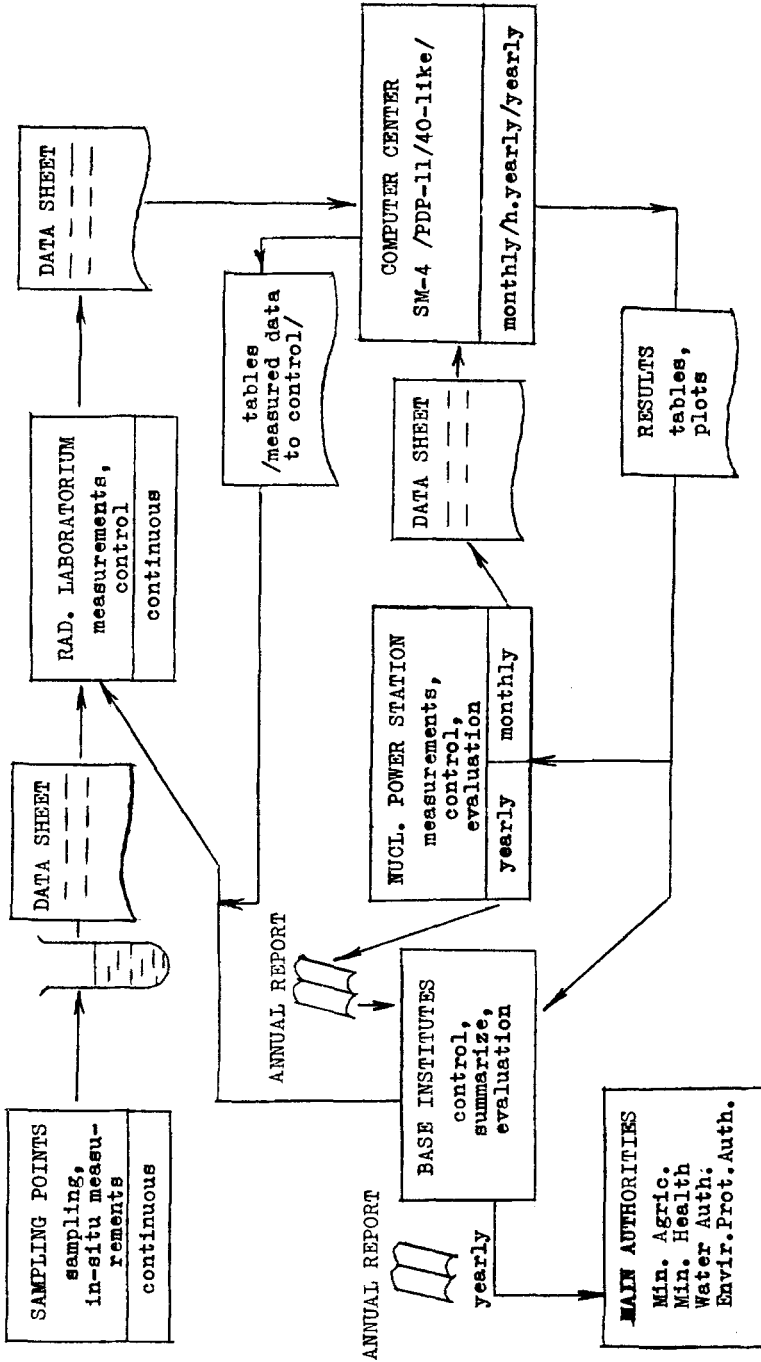


Fig. 1. Information-flow diagram

 * RADIOACT. CONCENTR. IN DANUBE-WATER *

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		MEAN BQ/KG	MINIMUM	MAXIMUM	CASES	BACKGR.
GROSS-BETA	UP-STREAM NPS DOWN-STREAM NPS	9.10 E-2 1.31 E-1	1.05 E-2 1.10 E-2	1.88 E-1 2.16 E-1	15 30	2.00 E-1
K-40, BETA	UP-STREAM NPS DOWN-STREAM NPS	8.00 E-2 7.68 E-2	6.10 E-2 4.30 E-2	1.06 E-1 1.07 E-1	6 18	1.00 E-1
GAMMA SPEC	AC-228 BI-214 PB-214 SB-124	1.58 E 1 1.13 E 1 7.60 E 0 3.10 E-3	1.58 E 1 4.90 E-3 5.80 E-3 3.10 E-3	1.58 E 1 2.26 E 1 1.15 E 1 3.10 E-3	1 2 (1) 3 (2) 1	
TRICIUM	H UP-STREAM NPS DOWN-STREAM NPS	5.48 E 0 6.91 E 0	1.80 E 0 3.70 E 0	8.70 E 0 2.70 E 1	12 24	7.00 E 0
SR-90+Y-90	SR UP-STREAM NPS DOWN-STREAM NPS	1.27 E-2 7.56 E-3	1.27 E-2 5.47 E-4	1.27 E-2 1.55 E-2	5 5	5.00 E-3
CS-137	CS UP-STREAM NPS DOWN-STREAM NPS	9.80 E-4 6.30 E-4	9.80 E-4 4.60 E-4	9.80 E-4 9.20 E-4	1 3	2.00 E-3

FIG. 2. RADIONUCLIDE CONCENTRATIONS IN THE DANUBE-WATER

different basic institutes have developed an off-line computer system to support the activities of the authorized environmental control system, rather for normal operation of the power plant, Paks.

The Information-flow of the System

Figure 1 shows the information-flow diagram of the off-line system. The data both of the sampling and the measurements are collected on a data sheet common for all the authorized laboratories. The sampling, measuring and transmitting of the data sheets to the computer center are activities carried out continuously. The number of data collected from the authorized monitoring is about 20,000 a year.

The main meteorological parameters and the releases to the atmospheric and aquatic environment measured by the power station are transmitted to the data center, monthly.

To insure a checking possibility for the laboratories the computer center returns the data transmitted by each laboratory to themselves. This output gives the original data sorted according to the data of sampling, type of measures, etc.

Data processing

The data processing activity is categorized like the types of regular and special processing.

The regular output presents tables of the mean and boundary values of the measured data, and also the number of cases and some remarks /e.g. limits of the quantity in question/. Figure 2 gives an example related to the concentration of the different nuclides in Danube-Water up-stream and down-stream to the power station. Tables like these are printed in connection to atmospheric and hydrospheric releases, the environmental dose intensity and to the concentrations of nuclides in soils, fallouts, surface waters, fodder plants, drinking water, milk and meat.

Due to additional interests of the basic institutes special processings are carried out. For this and also for the statistical analysis of the data parts of the Biomedical Computer Programs /BMDP/ Package have been installed.