

PERSONAL DOSIMETRIC MONITORING IN UKRAINE: CURRENT STATUS AND FURTHER DEVELOPMENT

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Current status of dosimetric monitoring in Ukraine

In Ukraine the number of individuals exposed occupationally, medically or by residence in the areas with technogenically enhanced levels of radiation is scoring tens of thousands. Unfortunately, individual dosimetry is performed by uncoordinated laboratories, using obsolete equipment and practicing inadequate measurement techniques, there is no centralized infrastructure for concentration and dissemination of information on individual doses. Aforesaid calls for elaboration of the nationwide System for management and coordination of dosimetric monitoring as well as deep modernization of existing dosimetry services.

Presently Ukraine has mixed system for dosimetric monitoring. Nuclear power plants and some major nuclear facilities have their own dosimetry services, which are responsible for regular dosimetric monitoring of workers. Rest of occupationally exposed persons is monitored by dosimetry laboratories affiliated to the territorial authorities for sanitary and epidemiology supervision.

In 2002-2003 Ukrainian Ministry of Health performed survey of the status of dosimetric monitoring and inventory of critical groups requiring such monitoring. Dosimetry services in Ukraine cover about 38,000 occupationally exposed workers, including 9,100 medical professionals, 16,400 employees of 5 nuclear power plants and ca.12,400 workers dealing with other sources of occupational exposure (industry, research) (Figure 1). Territorial dosimetry services operate in 13 of 24 oblasts of Ukraine, using DTU-01 manual TLD readers produced with one exception in 1988-1990. The coverage of critical groups by dosimetric monitoring is variable and ranges from 38% to 100% depending on the oblast.

Personnel of nuclear power plants (about 16,400 workers) is monitored by their own

dosimetry services achieving absolute coverage of the main staff and temporary workers. NPPs IDM instrumentation and covering is shown in Table 1

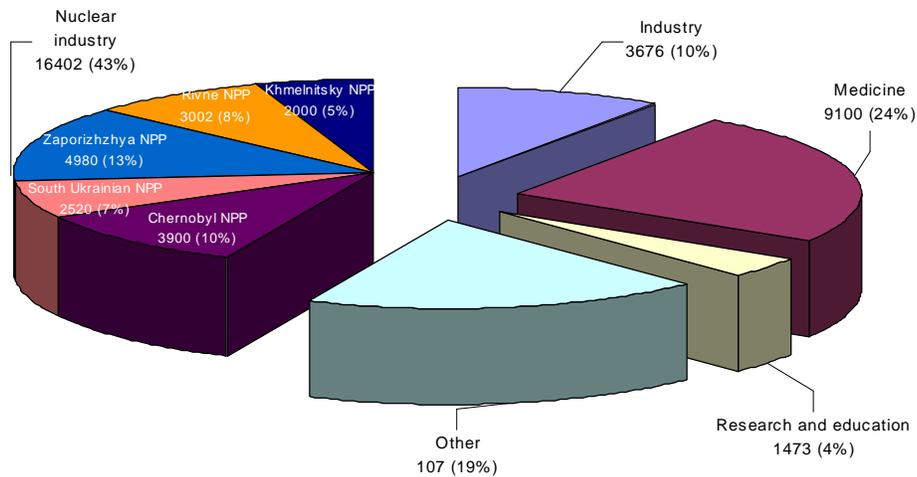


Fig.1. Structure of Ukraine Dosimetry services coverage

Table 1. Nuclear power plants dosimetry services

Nuclear power plant	Instrumentation	Year of installation	Number of dosimeters	IDM covered persons
Chernobyl NPP	Harshaw 8800	2000	-	3900
South Ukrainian NPP	КДТ-02М	1983-1991	3600	2520
Zaporizhzhya NPP	КДТ-02М	1983-1994	13000	4980
Rivne NPP	АКІДК-101	1994	8000	3002
Khmelnitsky NPP	КДТ-02М	1985-1998	1194	2000

Instrumentation used for monitoring of nuclear workers is different: Chernobyl NPP operates new Harshaw 8800 TLD systems, semi-automated TLD system AKIDK-101 (Russia) is used in Ryvne NPP; personnel of three other NPP is monitored using manual TLD readers KDT-02M. Each of five NPP has its own data environment.

Dosimetric monitoring of medical personnel is mainly performed from the single service - Central laboratory of radiation hygiene of medical personnel affiliated to the Grigoriev Institute of Medical Radiology AMS Ukraine in Kharkiv. Totally, 5,500 medical staff members are monitored by this service on quarterly basis using obsolete manual TLD readers DTU-01.

Elaboration of the united system

The System is intended to cover all aspects of efficient dosimetric monitoring, in particular- provision of methodical unity of individual dosimetric monitoring, scientific and methodological guidance of individual dosimetric control, procurement of common technical policy regarding nomenclature and operation of instrumentation, implementation of quality assurance programs, development and support of common information infrastructure intended for logging, storage and access to data on individual dosimetric monitoring as well as keeping the national registry of individual doses, training and certification of personnel engaged in the System of individual dosimetric monitoring. Three levels of the System (Figure 2, Table 2) have different goals and responsibilities.

Table 2. Tasks of the Levels of the proposed System

Level	Tasks
Level 1 (Central IDM lab, dosimetry registry and coordination centre)	development of the guidelines in the area of dosimetric monitoring and data handling; provision of methodological support for operation of the System; development and implementation of the unified technical policy; development of the information infrastructure; analysis and dissemination of data regarding the results of dosimetric monitoring; training and quality assurance for the local dosimetric monitoring facilities.
Level 2 (Regional IDM services)	maintain regional dosimetry registries; concentrate the results of dosimetric monitoring performed in the region of their responsibility by all dosimetry services incorporated into the System; take over routing dosimetric monitoring in respective territories (later, when laboratories of the second level will be equipped with modern equipment).
Level 3 (a) (well equipped dosimetry laboratories of the NPPs)	routine dosimetric monitoring of the personnel; dosimetry database management and keeping raw data of dose measurement; transfer of the results of dosimetric monitoring to the State dosimetry registry.
Level 3 (b) (territorial sanitary and epidemiology stations)	distribution and collection of dosimeters, which are issued by the laboratories of the first and second levels; supervision of the usage of dosimeters; feedback to end users – transfer of the results of monitoring to persons and management; maintaining of the local level of the State dosimetry registry.
Level 3 (c) (independent services after proper accreditation)	dosimetric monitoring on commercial basis following methodological guidance provided by the first level of the System; keeping of the raw data of dose measurement; transfer of the results of dosimetric monitoring to the State dosimetry registry.

The process of development of the System will have several stages. At the first stage information infrastructure of the System should be established and measures will be taken for harmonization of the measurement techniques. At the second stage well equipped central laboratory will be established eliminating inefficient small dosimetry services. At the third stage regional laboratories (Level 2) will be established and equipped with modern instrumentation.

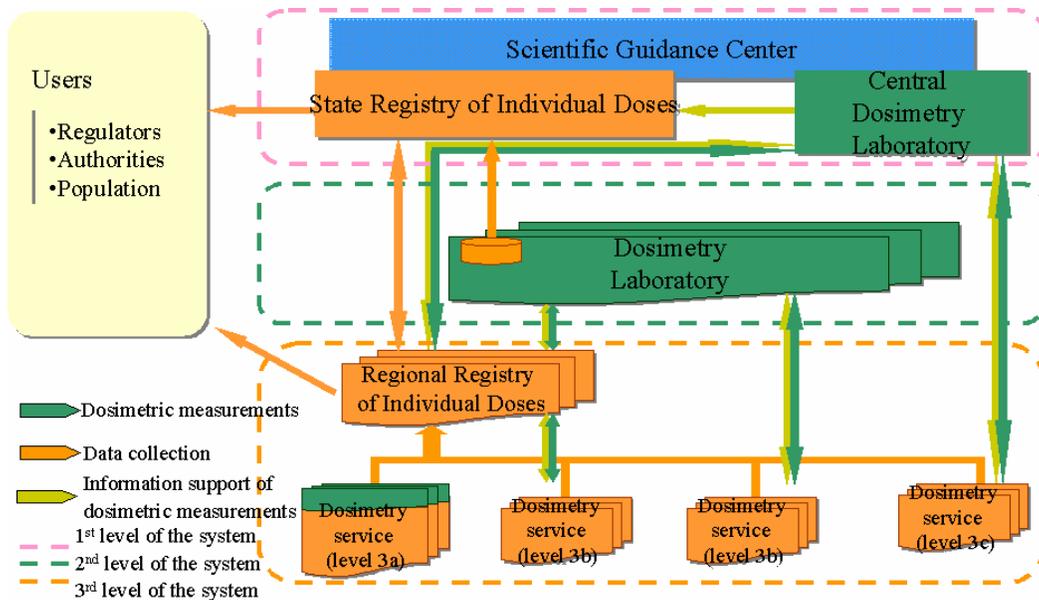


Fig.2. Structure and operation flowchart of the unified state system for monitoring and registration of individual doses of population

Conclusions

Current inadequate status of dosimetric monitoring infrastructure in Ukraine demands an urgent elaboration of the united state system for monitoring and recording of individual doses. The proposed plan would allow to bring dosimetry infrastructure in Ukraine to the modern state which would be compatible with existing and future European and international radiation protection networks.

Unitary structure of Ukraine, strong administrative command and good communications between regions of the country are positive factors in favour of efficient implementation of the proposed plan. Deficiencies are associated with limited funding of this effort.