TÜRKİYE OCCUPATIONAL EXPOSURE LEVELS AND DOSE REGISTRATION SYSTEM

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ABSTRACT

According to Presidential Decree No:95, establishment, operation and development the National Central Dose Registration System, following the dose records in the system, examination and inspection the institutions where radiation workers work in coordination with the relevant service units when necessary, are among the duties and authorities of Department of Radiation Protection of Nuclear Regulatory Authority (1).

In this poster presentation, information is given about dose limits determination for radiation workers, pregnant radiation workers, intern/student, public and National Central Dose Registration System, which are within the scope of the duties and authorities of the Nuclear Regulatory Authority. Among the information to be given are reference levels, annual dose limits for radiation workers, pregnant radiation workers, intern/student and public, data contents and dose result report data content of National Central Dose Registration System and also other notes on dose registration system.

REFERENCE LEVELS

Levels determined for the purpose of initiating a special application for any size used in radiation protection programs. The reference levels determined by the Nuclear Regulatory Authority are given below;

1- Recording Level: In order to ensure radiation protection, it is necessary to keep records of equivalent doses or effective doses in the National Central Dose Registration System. The dose limits recorded in monthly periods for radiation workers are above 0.2 mSv.

2- Review Level: Equivalent dose requiring further examination, if exceed 2mSv/month.

3- Intervention Level: Equivalent dose requiring intervention if exceeded 50mSv/month (2).

ANNUAL DOSE LIMITS FOR RADIATION WORKERS

1- The effective dose limit for radiation workers is 20 mSv on average for five consecutive years and 50 mSv in any given year.

2- The annual equivalent dose limit for the hand and foot or skin is 500 mSv, and for the eyepiece it is 150 mSv (2).

PLANNED IRRADIATION FOR SPECIAL CASES

1- There are irradiations that occur in normal applications and require effective dose exposure over annual dose limits, but in special cases where there are no other methods other than irradiation, these over doses are carried out with the permission of the Nuclear Regulatory Authority.

2- For radiation workers who will be exposed to irradiation in special cases, dose limits are 50 mSv in any given year, an average of 20 mSv per year in 10 consecutive years, and a total of 100 mSv (2).

DOSE LIMITS FOR PREGNANT RADIATION WORKERS

1- The effective dose limits of the pregnant radiation worker are 1 mSv per year, which is the maximum dose that the society can receive.

2- Female employees during breastfeeding are not employed in jobs that are at risk of radioactive contamination (2).

DOSE LIMITS FOR INTERN/STUDENT WHO ARE 16 TO 18 YEARS OF AGE

For occupational exposure of apprentices of 16 to 18 years of age who are being trained for employment involving radiation and for exposure of students of age 16 to 18 who use sources in the course of their studies, the dose limits are:

1- An effective dose of 6 mSv in a year;

2- An equivalent dose to the lens of the eye of 50 mSv in a year;

3- An equivalent dose to the extremities (hands and feet) or to the skin of 150 mSv in a year (2).

DOSE LIMITS FOR THE PUBLIC

(1) The limit of the personal annual effective dose that the public can receive in case of exposure to radiation in planned exposures is 1 mSv. Higher limits per year, with an average of 1 mSv for five consecutive years, may also be permitted by the Authority, provided that it is justified by the Authority.

(2) Provided that the provisions of the first paragraph are valid, the annual equivalent dose limit is 15 mSv for the eye lens and 50 mSv for the skin. The average equivalent dose taken over 1 cm2 of any area of the skin exposed to the radiation dose is considered as the skin equivalent dose.

(3) The provisions of the first and second paragraphs shall apply to the persons who will be visiting the nuclear facility as visitors and to the facility employees other than those working with radiation (3).

NATIONAL CENTRAL DOSE REGISTRATION SYSTEM

1- Persons working in case of A Class working condition who is likely to receive more than 6 mSv of effective doses per year or equivalent doses of more than three-tenths of the dose limits given for eyepieces, skin, hands and feet) are required to use ''*a personal dosimeter*''.

2- Radiation workers who are not classified as class A workers are classified as class B workers. The organization periodically evaluates the dose they receive in order to confirm that the classification of those working with Class B radiation is done correctly. This assessment is based on the results of the radiation field monitoring. The personal dose of the class B worker can also be monitored when necessary.

3- Evaluation of doses of those working with radiation provided by dosimetry services approved by Nuclear Regulatory Authority.

4- The results of dosimetric evaluation are processed into *''the National Central Dose Registration System'' which is centralized database where dose records are maintained and managed by the Nuclear Regulatory Authority* (2).

OPERATION OF THE NATIONAL CENTRAL DOSE REGISTRY SYSTEM

1- National Central Dose Registry System operated by the Authority.

2- The Authority examines whether the data is transferred to the National Central Dose Registration System by the dosimetry service in accordance with the provisions of Regulation on Authorization of Organizations to Provide Dosimetry Service . If an error is detected regarding the data entry, the necessary corrective and/or preventive actions are reported to the dosimetry service in order to eliminate this error and prevent it from recurring (4).

DATA CONTENT OF THE NATIONAL CENTRAL DOSE REGISTRY SYSTEM

1- The data obtained as a result of the evaluation of the dosimeters are transferred to the National Central Dose Registration System in accordance with the content determined by the Authority (Table 1).

2- In cases where changes are required in the data transferred to the National Central Dose Registry System, the dosimetry service applies in writing to the Authority with its justifications, information and documents. As a result of the examination of the application by the Authority, if the issues declared by the dosimetry service are found appropriate, the data is changed by the Authority (4).

Dosimetry Service Name:	Year:	Usage Start Date:	Measured Dose Value:	Body Area Where the Dosimeter Is Used:	Data Transfer Date:
Dose Information Id:	Month:	Usage Finish Date:	Department Worked:	Research Form Submission Date:	Record Change Date:
Institution Name:	TC Identification Number:	Ready for Distribution Date:	Type of Dosimeter:	Evaluation Report:	
Institution's Code:	Name Surname:	Service Evaluation Date:	Application Area:	Estimated Dose Value:	
Dosimeter Period:	Day of Use:	Dosimeter No:	Profession:	Situation:	

Table1. National Central Dose Registration System Data Content

DOSE RESULT REPORT DATA CONTENT (IN CASE OF OVER DOSE)

1- The dose result report of the persons who receive the dosimetry service includes the information determined by the Authority in addition to the information that should be included in the General Requirements Standard for the Competence of TS EN ISO/IEC 17025 Experiment and Calibration Laboratories (Table 2 and Table 3).

2 - The explanation regarding the dosimeters returned unused or not returned for any reason is stated in the dose result report for the relevant period.

3 - The dose result report is signed by the technical personnel who evaluates the dose and by the personnel responsible for the dosimetry service.

4 - If the person uses more than one dosimeter, each dosimeter result is included in the dose result report separately (4).

Dosimetry Service:	Dosimetry Service Evaluation Result:
TC Identification Number:	Measured dose value:
Name Surname:	Estimated dose value:
Form No:	The date of sending the form to the institution:
Dosimeter ID:	The date of the institution 's response to the form:
Institution Name:	Date of estimated dose value:
Institution's Code:	Situation of dosimeter usage: Active/Passive/Cancelled/Waiting for approved

Table2. National Central Dose Registration System Dose Evaluation Report

Identity Number:	Biological Dose Value:
Report Request Date:	Staff Dose Equivalent:
Report Result:	Date of Report:
Institution Name:	Date of not working started:
Internal Dose:	Start date of working:
Whole Body Active Dose:	Diagnostic explanation:
Authorized Health Institution:	Situation: Active/Passive

Table3. National Central Dose Registration System Health Report

OTHER NOTES FOR DOSE REGISTRATION SYSTEM:

1- Doses taken during accidents are separated from doses taken under operating conditions. These doses are processed separately by the dosimetry service to the National Central Dose Registration System.

2- The dosimetry service provides radiation workers information about their own dose records.

3- In the event that the employee leaves the post and starts working elsewhere, employee gives a copy of the dose records to the employer and ensures that the dose records are kept confidential.

4- Personal dose records are stored in the Central Dose Registration System not less than 30 years after the end of the work requiring radiation exposure, during the working life in which the employee is exposed to radiation and then until the year the person reaches the age of 75 (3).

REFERENCES

1.-*Presidential Degree No:45:Presidential Decree on Organization and Duties of The Nuclear Regulatory Authority (Official Gazette Date: March,8,2022, Official Gazette Issue:23999)*

2-Regulation on Radiation Safety (Official Gazette Date: March, 2000 , Official Gazette Issue: 23999)

3-Regulation on Radiation Protection in Nuclear Facilities (Official Gazette Date: May 29, 2018 , Official Gazette Issue :30435)

4-Regulation on Authorization of Organizations to Provide Dosimetry Service (Official Gazette Date: December 31, 2021 , Official Gazette Issue :31706