

REGULATORY ASPECTS OF LOW DOSES CONTROL IN ALBANIA

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Abstract

In the present paper are described the status of regulatory aspects of low doses control as well as the existing procedures for their implementation in Albania. According to new Radiological Protection Act, approved by Parliament in 1995, the establishment of the infrastructures in radiation protection area is in course, accompanied by the installation and functioning of new equipment for low dose control. Based in many years experience it is concluded that personal doses of the workers added by practices in Albania are 1/10 of dose limits. Some particular cases of overexposed workers were investigated. Last times the elements of the optimisation procedures (QA and QC) are outlined in the frame of improving regulatory aspects of low doses control.

1. Introduction

The importance of the measuring and recording of low doses added by practices has been underlined from the first regulatory document on Safe Handling of Ionizing Radiation Sources, issued by Albanian Government at 1971 [1]. Only a year after, Institute of Nuclear Physics (INP) began the research work concentrated in measuring of low gamma doses by photographic film method. For this purpose has been used the ORWO RD 3+4 film (produced by former East Germany) in connection to FD-III-B filtered plastic badge. This work aimed to measure and to asses gamma and X-ray doses of the workers in diagnostic and therapy radiology as well in other nuclear techniques applications [2]. Later the measuring of beta and slow neutron doses were included in INP research works. Soon after receiving of the first results, photographic film method served as a solid base for measurements of low doses for the majority of radiation workers in Albania, especially in the field of diagnostic radiology, with wide spread in the country. By this method the radiation protection status of the workers was under regular control till 1986 when as result of difficulties in providing ORWO RD 3+4 film, IAEA had proposed the substitution of the film method by thermoluminescent dosimeters. For this purpose INP was furnished at that time with a Harshaw TLD Reader Model 2000 and a limited number of TL cards and chips. Since this period in Albania is in course the control of low dose added by practices through TLD method. Some important improvements in this area are performed last year in the frame of the participation of Albania in the IAEA Model Project on Radiation Protection and Waste Management.

2. Radiation Protection Infrastructures in Albania

The International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources [3] identifies the essential parts of a national radiation protection infrastructure as being: legislation and regulations; Regulatory Authority empowered to authorise and inspect regular activities and to enforce the legislation and regulations; sufficient resources and an adequate number of well-trained personnel. The mentioned Radiation Protection Decree [1] had tried to give due importance to these elements

through the establishment of Radiation Protection Commission as the National Regulatory Authority. This Commission had issued many important documents like Permissible Maximal Levels of Radiation, Medical Examination of Radiation Workers, Safe Transport of Radioactive Materials etc. Nearly in all nuclear facilities of the country were appointed Radiation Protection Officers. Two years ago Albanian Parliament had approved the new Radiological Protection Act [4]. According to this Act, last year has been done the reorganisation of Radiation Protection Commission within the Ministry of Health. From the other side was established the new executive organ of the Commission, Radiation Protection Office. The scheme of the actual Radiation Protection Infrastructure of the country is presented in Fig. 1.

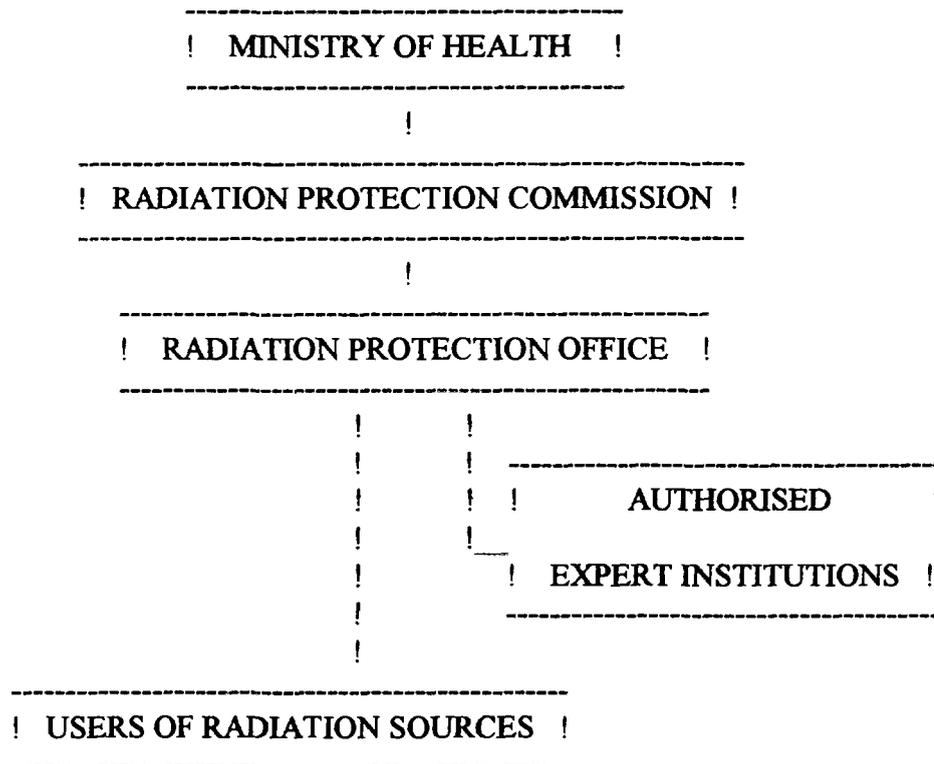


Fig. 1 Radiation Protection Infrastructure in Albania

Soon after its establishment, Radiation Protection Office began the preparation of two regulations:

1. Regulations on Licensing and Inspection of Ionizing Radiation Activities.
2. Regulations on Safe Handling of Radioactive Materials and other Radiation Sources.

The first document contains the principal rules for the processes of Notification, Registration or Licensing by any legal person intended to carry out any of the action specifies by Radiological Protection Act. The second one prescribes the basic rules which provide the safety of ionizing radiation sources activities. These two documents are intended to come under review by Radiation Protection Commission and later to be issued as governmental decrees. At the same time by the mentioned Office are outlined the preparation of the Codes of Practices, especially for Radiology and Nuclear Medicine with special emphasising to ALARA principle. Particular attention is given by the Commission to the problems of the education and training of the workers in the field of radiation protection. Some National Training Courses and Workshops are planned to be conducted for education, upgrading and updating of radiation protection knowledge and skills of workers and Radiation Protection Officers of the country. The participation of Albania in

the IAEA Model Project on Radiation Protection has provide a solid base for the strengthening of all radiation protection activities which are conducting in the country and their development in accordance to international well-known norms and equipment.

3. Control of Low Doses

In accordance to Radiological Protection Act, all legal persons are obliged to perform external dose monitoring of the workers based in appropriate personal dosimeters as well as to provide all the necessary measures for a safe activity toward the environment and public. At present time this monitoring is based on TLD cards and INP is appointed as accredited laboratory for this goal. INP provides TLD cards for all users on monthly base and after collecting and reading of all dosimeters prepares special lists for every user, which contain the averaged whole body doses of the workers. Copies of those lists are presented yearly to Radiation Protection Commission too. The calibration of dosimeters is carried out in INP through three standards gamma sources. The lower detectable dose is nearly 0,1 mSv [5]. INP posses a new Harshaw TLD Reader Model 4500, which was installed last year. With 1200 TLD cards of Bicron (type LBG 0110) INP actually has technically the possibilities for extension of dose monitoring to radiation workers all over the country. As result of dose monitoring activity, which was exerted during past 20 years it is concluded that in average the personal dose of the workers is nearly 5 mSv per year or 1/10 of dose limit. A special attention was paid to every exceeding of dose limit through the careful investigations. This was carried out not only to clarify the reasons of the event but to take necessary measures for prevention of such irradiation in the future. It is worth to mention two cases of overexposures, which were occurred during performing industrial field radiography and instrument calibration process in army. By the careful investigation in situ, it was concluded that in the first case the irradiation of the workers had been the result of a bad planification of irradiation process. In the second case there was a false irradiation, because the dosimeter was kept near the calibration source. In accordance to existing legislation, radiation workers are classified in two categories:

a) The workers of controlled areas and b) the workers of supervised areas.

Both workers categories need for dose control. Since in the past the number of TLD cards was not sufficient, in the dose monitoring system was included only the first category of workers; for the second category were performed periodical measurements. With new equipment INP now is in process of extending step by step the personal dose monitoring for all radiation workers. Nevertheless from the practical point of view some administrative issues create the barriers for a good practice in this field. Sometimes the responsible persons give not enough care to control of workers. It is often that TLD cards were not returned in defined delays or worse, a number of TLD cards were lost during keeping or transportation. Some workers put the cards near the radiation sources creating false exposures. A great deal of work was done during the Chernobyl accident for the environment dose control. This control was carried out based in regular measurements of principal radioisotopes concentration in air and foods. By this control were created the possibilities of public dose reducing through non consumption of contaminated fresh milk in north-east region of Albania or through continuous water washing of fruits and vegetables during the accident's days. The average dose for members of public by this accident in Albania was less than 1 mSv [6]. Last times in the country had been undertaken some effort toward the implementation of elements of Quality Control (QC) and Quality Assurance (QA) especially in the field of radiological medical examinations. The main source of exposures for both workers and public in the country is the diagnostic radiology. For this purpose it would be of great importance the development and implementation of Guidance Levels for

radiological procedures according to Basic Safety Standards, considering the actual status of the local equipment. Last years INP has carried out many measurements for patient entrance doses for different procedures using TL chips. Those measurements have shown that the ratio of measured dose to guidance dose has varied between 1 to 3, therefore one can deduce that Guidance Levels are restrictive for Albania. The main reasons for higher exposures are related to the obsolete X-ray machines, the lack of filtration or diaphragms etc. At the near future it is intended to begin the control of fluoroscopic X-ray machines, based in new X-ray Beam Quality Analyser. Just now in the country exist a great number of fluoroscopic X-ray machines and their contribution in medical exposures is very high. It is understood that the performing of QC and QA procedures is not an easy task for Albania. The issues of defining and implementing of Guidance Levels and other related procedures require common efforts by Regulatory Authority of the country and well-trained specialists like physicists, radiologists etc.

References

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