

Occupational Radiation Protection in Mali : Case study of dose limit exceedings

1. Abstract: In Mali, Occupational Radiation Protection was relaunched in 2005 after many years of interruption. Since then the service has been continuously delivered with no interruption. This result was achieved due to IAEA decision at that time to provide the Regulatory Body (since there was no private service provider) with the necessary training and equipment: TLD reader (HARSHAW 4500) and accessories (TLD cards, external irradiator, nitrogen generator, etc.). Then in 2010, the Government of MALI, provided AMARAP (the RB) with a new TLD Reader (HARSHAW 6600plus) and more TLD cards. About 650 radiation workers are (or were) monitored either individually or collectively on a quarterly basis (mostly for radiotherapy department).

Some regulations have been adopted by the government Mali (Decree N°06-488 /P-RM of 23rd November 2006 replaced by the Decree n°2014-0931/P-RM of 31st December 2014) which cover the subject of occupational radiation protection. And there are some provisions about how regulations require the implementation of radiation protection programs by end-users as well as provisions about requirements for the authorization of technical services (service providers) related to occupational exposure.

Up to now some workers are monitoring for external exposure and effective dose (Hp(10)). There is neither extremity dosimetry nor internal dosimetry yet.

One staff member participated in the 2nd International Conference on ORP, held in Vienna in December 2014 with a contributed paper intitled "Occupational Radiation Protection in Medicine in Mali".

Since this 2nd conference, in our laboratory, we have developed internal procedures which include some dose reference levels such as: Recording Levels (any dose obtained after subtraction of travel dose) and Investigation Levels.

But dose limits not to be exceeded are given by regulations (decree of 2014) which are compliant GSR-Part3. However, we noticed:

- ☒ one case of investigation levels being exceeded, and
- ☒ two cases of average dose limits being exceeded in facilities working of sectors.

The aim of this paper is:

- to share the levels of recorded doses,
- to share our experience of how we dealt with these situations: actions taken by the RB and by the end-users,
- and to seek for advice on what would have been the best way to proceed.

1. Cases of high doses: According to our procedures, our Investigation Levels are:
2. for Hp(10): 6 mSv quarterly and 2 mSv monthly;
3. for Hp(0,07): 25 mSv quarterly and monthly.

According to our regulations, for adult workers, doses limits are:

- an average effective dose of 20 mSv per year over five consecutive years (100 mSv in five years) and a maximum of 50 mSv in a single year;
- an average equivalent dose to the eye lens of 20 mSv per year over five consecutive years (100 mSv in five years) and a maximum of 50 mSv in a single year;
- an equivalent dose of 500 mSv per year to the extremities.

But we noticed:

- One facility with Hp(10) twice higher than the investigation level
- Two facilities with Hp(10) over 20 times annual

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