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Evaluation of Medical and Dosimetric Monitoring Of the Personnel Exposed To Ionizing Radiations in Industry

Hammou A. Ben Hariz N. Ben Omrane L.

INTRODUCTION

Increasing use of the ionizing radiations in industry, in particular in the field of the non destructive testing (NDT) exposes the operators to low radiation doses. Therefore Radiation protection measures in this field are needed. We report the results of a survey carried out on a sample of 50 workers in NDT in Tunisia; Our purpose is to evaluate the professional training levels in radiation protection of the operators, to determine their exposure dose rate. In case of over-exposure, to determine the causes, to evaluate the medical follow-up, and to propose adequate recommendations

MATERIEL AND METHODS

The study concerns 50 exposed workers to the ionizing radiations: in 5 Offices of Control and technical inspection, and 2 Companies of Public works.

Three sources of information for the collection of the data were used :

- Questionnaire of the exposed agents and of the Directors of company
- Questionnaire of the officially agreed doctors of work
- Files of the dosimetry laboratory of the CNRP.

In an other hand all the cases of over-exposure according to the files of the CNRP since the eighteens.

RESULTS

Following are the main remarks about our population:

- Distribution of the agents on the companies:

Average age: 39 years

Grade in function:

- 9 senior staff ,
- 22 high-level technicians,
- 17 technicians
- 2 drivers

- Training in NDT:

TRAINING	SPECIFIC	ON THE FIELD	NO TRAINING
NUMBER	34	14	2

- Number of hours of monthly exposure:

	senior staff	high-level technicians	technician	drivers
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Exposure time	0 to 20 mn	0 to 20 hours	0 to 40 hours	0 to 20 hours
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- Length of service and exposure to the radiations : 64% have a seniority 5 years regular Medical supervision in the search of random effects.

- Means of radiation protection use:

- Use of lead screen:

90% of the agents do not have these tools on the field

- Use of radiameters :

28% of the agents are not equipped with this type of devices

- Use of operational dosimeter:

32% of the agents are not equipped with pen dosimeter

- Delimitation of the zones controlled by all the

companies.

- Dosimeter monitoring:

92% of the agents are supervised by TLD;

96% of the supervised agents have annual equivalent amounts < 20 mSv/year.

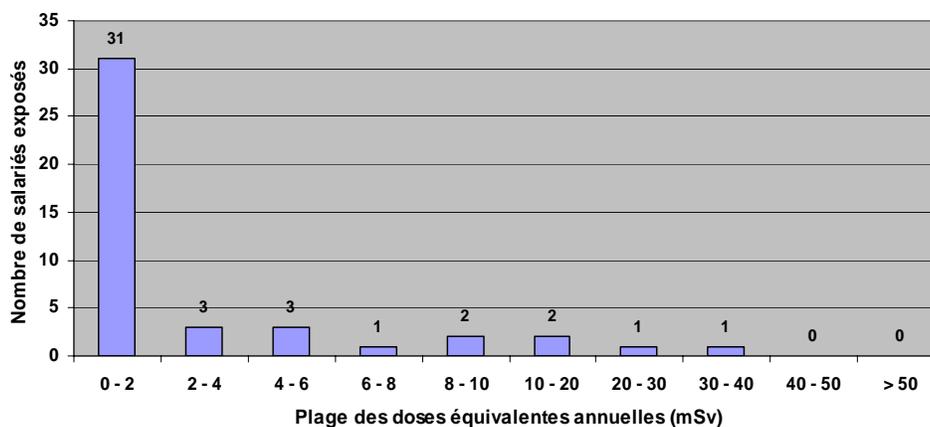
Pick de frequency of annual dose equivalent is between 0 and 2 mSv

1 agent recently recruited and non initiated in radiation protection have an annual dose equivalent: 36.54 (> 20 mSv/an)

Senior staff members have low rates < 2 mSv/an;

- Dose equivalent distribution

Distribution des salariés en fonction des plages des doses équivalentes annuelles



- Training in Radiation protection :

72% of the agents acquired training in radiation protection.

- Medical supervision:

84% of are the agents followed by doctors work; -
The causes of over-exposure join those of the literature.

CONCLUSION

Satisfactory dosimetric and medical monitoring as well as Annual equivalent amounts.
The causes over exposure join those described in the literature. Insufficiencies persist in radiation protection tools on the field and require the setting of a preventive and corrective strategy: The awareness of the employers to be equipped with devices like operational dosimeters and detectors and lead screens, the motivation of the operators on the need for training in protection against radiation and the continuous training of these operators. The optimization of the protection and a data base in traceability of the use of radiations by the realization of the inspections by the qualified people of the CNRP. To ensure themselves of conformity techniques of the places of storages of the radioactive sources, to diagnose the means of transport used by the various companies as well as the procedures of radiography on building site; The awareness and coordination with the doctors of work . The need for special register. The training of doctors of work themselves in radiation protection is programmed after this study.