

# Radiation Safety Assessment of licensees using radioactive material in form of open sources

**HOLZWARTH R., JÖNSSON H.**

*Swedish Radiation Safety Authority (SSM), SE-171 16 Stockholm, Sweden*

**Abstract.** During 2009 – 2011 the Swedish Radiation Safety Authority (SSM) performed 12 inspections of licensees working with open sources. The working areas of the licensees covered Research & Development (R&D) within private companies, academic related research and industrial process diagnostic measurements. Based on these inspections a Radiation Safety Assessment was performed in order to get an overview about the stage of radiation protection at licensees. This paper outlines that generally there is a satisfying radiation safety culture spread and no serious issues were detected. However a few inspections led to injunctions, covering areas like education, routines and methods for contamination measurements and categorisation of workers and working areas. This paper will discuss the outcome of the Radiation Safety Assessment with respect to legislative requirements, organisation of radiation protection on site and safety culture.

**KEYWORDS:** *Radiation Safety Assessment, Open Sources*

## INTRODUCTION

The Swedish Radiation Safety Authority (SSM) performed a radiation safety assessment based on 12 inspections of licensees working with radioactive material in form of open sources. This corresponds to nearly 20 % of all concerned licensees. The working areas of the licensees covered Research & Development (R&D) within private companies, academic research and industrial process diagnostic measurements. The Radiation Safety Assessment was performed with focus on the following topics:

- Legislation and requirements: It is analysed to which extend licensees follow and live up to legislation requirements.
- Organisation of radiation protection: Focus is put on how radiation protection is organized and implemented
- Safety culture: Based on personnel resources, economic resources and competence the conditions for continued working activities while applying sound radiation protection are evaluated

Purpose of the Radiation Safety Assessment was to identify areas of improvements within the topics mentioned above but also to further develop SSM's way of supervision.

## ANALYSIS

During the inspections focus was put on the radiation protection organisation within the licensee, education and competence, the quality handbook (which shall contain internal radiation protection rules, working routines, contamination control, etc.) as well as categorisation of workers and working areas.

Most often licensees have some kind of radiation organisation where the task distribution to employees with appropriate skills is put in place. This works quite well, however the radiation protection organization is of various degrees, depending on how the extend of the activities involving open sources. Most licensees perform very limited activities with open sources and hence only very few persons are concerned. Licensees with an extended activity need to have access to a qualified expert. Generally the qualified experts have profound experience within their area of competence and they have the possibil-

ity and do affect radiation protection at the licensee in a positive way. A challenge might be the replacement of retiring qualified expert as currently there is no system in place for education and formation of new qualified experts.

Generally speaking licensees follow regulations and only a few discrepancies from requirements were observed leading to injunctions in three cases. The strongest injunction covered lack of routines for measurement of contamination and documentation of doses and uncertainties concerning health control, incorrect categorisation of a working place and missing labelling of a controlled area. Another injunction covered documentation of education of workers with open sources and missing routines for health control. An injunction to a third licensee covered missing categorisation of workers.

### **ASSESSMENT AND APPRAISAL**

An assessment of the inspections shows that most licensees follow legislative requirements and those licensees who had deficiencies or just were some kind of unstructured saw the advantage of seeing over and improving their routines and ways of documentation. Several licensees made efforts prior to inspections in order to see over documentation, labelling and internal routines. However there exist certain deficiencies which should be handled in an adequate way. Generally one can say that licensees with extensive work are more aware of regulations and requirements and licensees with very limited activity concerning the use of open sources do not necessarily pay that much attention to relevant regulations and requirements.

All licensees had a radiation protection organisation which is adapted to the extent of their activities with open sources. SSM appraises that generally radiation protection is handled in a satisfying way, however in a few cases we observed deficiencies in radiation protection consciousness of workers and in order to prevent incidents it is of major interest to improve radiation protection culture. Most often those workers who deal open sources only occasionally and to a very small extend would profit from better radiation protection awareness.

Concerning the safety culture SSM appraises that all licensees have access to the radiation competence they need as well as sufficient economic and personal resources. Despite the few deficiencies were observed all licenses were engaged and ready to address the existing shortcomings. Generally, it was appreciated that SSM was on place and by performing an inspection radiation protection gained interest within the licensee.

### **SUMMARY**

The roughly 20 % of inspected licensees working with open sources generally have good knowledge of relevant regulations and requirements. Also necessary radiation protection competence is available and most of workers using open sources have appropriate radiation protection awareness. Nevertheless there are occasional deficiencies which have to be handled in an adequate way.