

Radiation Safety Assessment of industry licensees

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Abstract. The unit of Operational Practices and Work Activities at the Swedish Radiation Safety Authority conducts supervision of 1800 licensees within industries, research and development and veterinary medicine. Out of these, there are about 1100 licensees within industries that possess and use sealed sources or X-ray equipment.

A radiation safety assessment has been done to get an overview about the status of the RP situation among industry license holders. The assessment was based on inspections and reported incidents during 2009 and 2010 with focus on three topics, namely

1. *Legislation and requirements*

Based on observance of legislation and requirements

2. *Radiation protection on site*

Based on the licensees radiation safety organisation

3. *Probability that the licensee will continue to run the business in a safe manner regarding to radiation protection*

Based on personnel and economic resources and competence

The assessment indicates that many licensees fail to observe the regulations in every aspect. Half of the inspections led to injunctions covering quality systems and organisation, signs and labels, local work instructions and education and training. The radiation protection of the practical work on site was generally satisfactory and complied with what was expected by the activity even if some license holders had to improve or develop routines and documents. Probability that the licensee will continue to run the business in a safe manner regarding to radiation protection was assessed to be acceptable or satisfactory among the majority of the licence holders.

KEYWORDS: *Radiation Safety Assessment, Industry licensees*

INTRODUCTION

The unit of Operational Practices and Work Activities at the Swedish Radiation Safety Authority conducts supervision of 1800 licensees within industries, research and development and veterinary medicine. Out of these, there are about 1100 licensees within industries that possess and use sealed sources or X-ray equipment.

A radiation safety assessment has been done to get an overview about the status of the RP situation among industry license holders. The radiation safety assessment was based on inspections and reported incidents among industry licensees during 2009 and 2010. The assessment was performed with focus on the following topics:

- Legislation and requirements: It was analysed to what extent licensees follow and live up to legislative requirements.
- Radiation protection on site: Focus is put on how radiation protection is organised and implemented.
- Probability that the licensee will continue to run the business in a safe manner regarding to radiation protection: Based on personnel resources, economic resources and competence.

ANALYSIS

During the inspections focus was put on the license holders radiation protection organisation, competence and safety factors as labels and signs and local work instructions.

Deviations from legislative requirements were found among half of the inspected license holders which resulted in injunctions.

The license holder shall keep a file on the equipment containing sealed sources or X-ray tubes according to regulations. Any change in possession must be reported to the authority. A number of the inspected license holders had removed and discarded radioactive sealed sources without reporting it to the authority and were not able to show documents of proper handling at the time of the inspection. One had obtained equipment containing three high active sealed sources (HASS) without applying for a license which indicates weaknesses in quality systems and RP organisation. A number of the licensees had insufficient or lack of signs and labels in conjunction with the radioactive sources which lead to injunctions.

The license holder shall ensure that the personnel of concern is informed and trained. Such information and training shall include locally established rules for the safe handling of the source and specific information on possible consequences if the source is lost or damaged. HASS-regulations state that the information and training shall be documented and regularly repeated. There were license holders with HASS equipment who got injunctions due to lack of routines to educate workers repeatedly.

Six incidents among industry license holders were reported to the authority 2009-2010. Four of these incidents occurred when workers, without closing and locking the shutter on level gauges, entered boilers. The incidents were caused by lack of radiation safety routines and instructions and lack of markings in one of the cases. One inspection was initiated by an incident where workers feared to have been exposed to radiation during repair of X-ray equipment. The license holder was authorized to use, install and maintain X-ray equipment. The inspection showed weaknesses in marking and labeling of equipment, protection of pregnant women and local work instructions. SSM decided to prohibit the licensee to make maintenance and service of X-ray equipment until those deficiencies were corrected. The ban was lifted when SSM was pleased with reported actions but the licensee was put under special supervision in order to verify that the measures were taken into practice.

ASSESSMENT AND APPRAISAL

The assessment indicates that many licensees fail to observe the regulations in every aspect. Others followed and lived up to regulations and some had made efforts prior to inspections in order to see over documentation, labelling and internal routines. However, the fact that half of the inspected licensees had deviations indicates that the observance and/or awareness of the complete containment of the regulations are inadequate.

The license holders have radiation protection organisations to various extents. The radiation protection awareness of the practical work among workers was generally satisfactory and complied with what was expected by the activity even if some license holders had to improve or develop routines and documents. Deficiencies in radiation protection consciousness of workers were observed in a few cases and in order to prevent incidents it is of major interest to improve radiation protection culture. Some of the license holders showed weaknesses in record holding and sending reports to the authority which imposed the licensee to improve internal communication and clarify responsibility roles.

Probability that the licensee will continue to run the business in a safe manner regarding to radiation protection based on personnel resources, economic resources and competence was assessed to be acceptable or satisfactory among the majority of the licence holders since they had adequate competence and resources. Despite revealed deficiencies among licensees, all were engaged and ready to address the

existing shortcomings. The inspected license holders saw the advantage of seeing over and improving routines.