IMPROVEMENTS IN RADIATION PROTECTION USING A PROPRIETARY AUDIT SYSTEM

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ABSTRACT

The paper describes the International Safety Rating System (ISRS) and its application and suitability to auditing an organisation's radiation protection arrangements. Particularly pertinent elements in the audit system are identified and briefly described. The benefits derived from the practical application of the audit are identified.

INTRODUCTION

All health and safety management systems need to be tested in order to evaluate whether they are suitable, complete and working satsifactorily. Auditing is a tried and tested way of carrying out this process. Following a study of the proprietary audit systems available and of current audit methodology, the authors introduced ISRS at Oxford University during 1990. Departments or units within the University are audited individually. The system has been applied to all aspects of safety, including radiation protection. ISRS is the most comprehensive safety management audit system in the world. The audit provides for a methodical, detailed analysis and evaluation of each aspect of an employer's policy, organisation and arrangements for safety. The systems in place at the unit being audited are compared for completeness against the model safety system of ISRS. Auditors using ISRS are required to undergo a course of training which has been organised by or under the auspices of the system's authors, the International Loss Control Institute. They are also required to pass an examination at the end of the course.

ISRS identifies the likelihood of accidents occurring before they become either property damaging incidents or an accident involving people and this is particularly important for activities with both a potential for high cost and a public perception of high risk.

THE AUDIT SYSTEM

The audit measures up to twenty elements of a model safety management system (see table). It is a scheme of precise questioning with built-in verification techniques. A full audit consists of asking all questions in all elements. With a total of six hundred and fifteen questions being involved. However, the system is normally applied in a progressive manner through ten stages. At the lowest level (known as Standard One), only a total of eighty-six questions in a total of thirteen elements are asked. Points are awarded according to the verified answers given. In order to move to the next level in the system, a minimum points total must be achieved. In addition, a physical inspection of a representative sample of the unit being audited is carried out and scored again with a minimum score being necessary to progress. It is at Standard One that ISRS was introduced at Oxford University.

TABLE

THE TWENTY ELEMENTS OF ISRS

1. Leadership and Administration.
2. Management Training.*
3. Planned Inspections.
4 Task Analysis and Procedures.*
5. Accident Investigation.
6. Task Observation.*
7. Emergency Preparedness.
8. Organisational Rules.
9. Analysis of Accidents and Incidents.*
10. Training for Employees.
11. Personal Protective Equipment.
12. Health Control.
13. Programme Evaluation Systems.*
14. Engineering Controls.
15. Personal Communications.
16. Group Meetings.
17. General Promotion.*
18. Hiring and Placement.
19. Purchasing Controls.
20. Off-the-job Safety.

* Not used at the lowest level of auditing.

Following the questioning, verification, physical inspection and scoring phases of the audit, the auditors write their report on each of the elements. When the head of the unit and his team have had the time to digest the report, a full review meeting, involving the auditors, the head of the unit and various members of the safety management team, is held to discuss the audit's findings.

In addition to applying ISRS in the conventional manner, managers of high-risk activities often wish to ensure that certain elements of their management system are at a more advanced level than Standard One. Radiation protection arrangements are a prime example where the activity warrants the audit to be carried out at an advanced level. In these cases, they may ask for all questions in selective elements to be addressed. This enables auditors to determine the level a unit has achieved in a particular key element and to identify matters for development. The authors regard six of the twenty elements to be particularly relevant to radiation protection arrangements. These are task analysis, task observation, emergency preparedness, personal protection equipment (PPE), engineering control policy and planned inspections.

KEY ELEMENTS FOR RADIATION PROTECTION

Task analysis means that the components of the task or work are systematically examined in order to establish safe and effective procedures.

Task observation is a structured process by which there are checks on employees performing critical tasks (ie: those which have produced and/or possess the potential to produce a major loss to people, property or process, when not performed properly). Performance is expected to be in accordance with approved procedures.

Organisations need comprehensive emergency plans and this element measures the validity and comprehensiveness of emergency planning and questions the arrangements in place against the system standard.

Sound engineering and the proper maintenance of plant and equipment help to minimise exposure to harmful agents, such as ionising radiation. If engineering controls alone cannot provide sufficient protection, then the use of PPE is often necessary. The requirements for PPE need to be identified and thereafter, its proper selection, use and maintenance is essential. The questions in this element of the audit test that these arrangements are suitable and satisfactory.

Engineering control policy requires proper design installation and modification of both process, plant and equipment. In addition, before commissioning or recommissioning takes place, proper review procedures are required. Engineering policy is also meant to define responsibilities and questions in the element determine whether these matters have been addressed satisfactorily.

The purpose of planned inspections is to identify hazardous situations and organise remedial work before any losses can occur. There should be equipment inspections and general inspections to detect deviations from the required standards. Also necessary are inspections of critical parts and items and pre-use inspections of equipment. All inspections, regardless of title, should be planned at regular intervals and the inspections themselves should be monitored and accompanied by an effective written follow-up procedure. This elements' questions, therefore, are concerned with the effectiveness of inspections in the department, including those concerning preventative maintenance.

CONCLUSIONS

Auditing of University departments using ISRS is continuing at Oxford and is bringing about major improvements in safety. The work has demonstrated that it is possible to successfully audit particular management systems, ie: radiation protection arrangements within the overall system and the authors believe believe it is practical to make the necessary changes to ISRS scoring. In practice, auditing is proving to be an excellent aid to determining the areas requiring additional resources and in the prioritisation of remedial actions. Auditing emphasises the concept that safety must be managed. It has also become clear that auditing should always be set against a background of regular, thorough, physical inspections and other monitoring exercises.

The authors recommend that the use of a formalised audit system should be promoted as a method of significantly improving radiation safety arrangements.