Proposal for the improvement of IRD safety culture based on risk analysis

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\textbf{ABSTRACT}

The Safety Culture (SC) is a concept about the relationship of individuals and organizations towards the safety in a specific activity. Any organization that carries out activities with risks has a SC, even at minimum levels. People perceive different types of radiation risks in very different ways, therefore, to identify and to analysis of the possible radiation risks resulting from normal operation or accident conditions is an important issue in order to improve the SC in organization. The main is to present directrixes for the improvement of the safety culture in the Institute of Radiation Protection and Dosimetry - IRD through on risk-based approach. The methodology proposed here is: A) select a division of the IRD for case study; B) assess the level of the 10 culture safety basic elements of the IRD division selected; C) conduct a survey of the hazards and risks associated with the various activities developed by the division; D) reassess the level of the 10 basic elements of CS; And E) analyze the results and correlate the impact of risk knowledge on safety culture improvement. The expected result is improvement the safety and of safety culture by understanding of radiation risks and hazards relating to work and to the working environment; and thus enforce a collective commitment to safety by teams and individuals and raise the safety culture to higher levels.

Palavras-chave: Safety Culture; Risk Analysis; Radiation Sources
1. INTRODUCTION

The Safety Culture (SC) is a concept about the relationship of individuals and organizations towards the safety in a specific activity. People perceive different types of radiation risks in very different ways, for this reason, to identify and to analysis of the possible radiation risks resulting from normal operation, anticipated operational occurrences or accident conditions is an important issue in order to improve the safety culture in organization, as well as, to maintain the radiation risks as low as possible. The basic elements of the safety culture are [1]: 1.Priority of safety; 2. Visible leadership and commitment of top management with safety; 3. Timely identification and proper solution of safety problems; 4. Permanent focus on safety; 5. Responsibility, involvement and individual behavior in respect to safety; 6. Effective communication on safety; 7. Free reports on safety concerns; 8. Fair treatment for individual behaviors in respect to safety; 9. Continuous organizational learning about safety; and 10. Environment of trust and partnership on safety. All 10 Basic Elements are interrelated and they all must be present to achieve a strong safety culture.

Safety culture is a well known concept in the nuclear industry. It is recognized as an important factor in achieving high levels of safety performance [2]. Nevertheless, the Safety Culture in the facilities that carries out activities with sources of radiation has been a subject few developed and the literature on practical applications in this field is very scarce [1].

2. MATERIALS AND METHODS

A strong safety culture is part of the defense–in-depth and therefore needs to be integrated into everyday tasks. It should involve all levels of the organization from the top down [3]. For this reason, we are proposing that the current Safety Culture in the IRD be strengthened through the knowledge and management of the risks associated with activities with ionizing radiation sources. The knowledge and management of the risks is only one of the existing approaches to improving the SC of a facility. But the crucial point is the effective commitment of top management so that the improvement of the current safety culture is continually improved.
The IRD works for protecting the health and safety of people, and the environment, from the harmful effects of ionizing radiation. In order to fulfill these activities, the IRD maintains a total of 68 laboratories classified as supervised or controlled areas, where ionizing radiation sources are used in the form of sealed and unsealed radioactive sources and radiation emitting equipment. Work carried out in these laboratories involves exposure to alpha, beta and gamma-emitting radionuclides, and sources of neutrons and ionizing radiation generators. These laboratories are grouped into 5 Divisions, each one classified as a Radiation Facility according to the CNEN NN 6.02 [4]: Metrology; Radioprotection; Medical Physics; Dosimetry; Emergency. Furthermore, the IRD has a Radiological Safety staff directly connected to the direction of the institute.

The IRD safety culture assessment process will be developed in 3 phases, as recommended in document [1]: preparation, implementation and post-assessment. Five techniques are recognized to assess the safety culture: document review; process observation; surveys; interviews and focus Groups. The methodology proposed here is: A) select a division of the IRD for case study; B) assess the level of the 10 culture safety basic elements of the IRD division selected; C) conduct a survey of the hazards and risks associated with the various activities developed by the division; D) reassess the level of the 10 basic elements of CS; And E) analyze the results and correlate the impact of risk knowledge on safety culture improvement. Risk analysis is the process of gathering data and synthesizing information to develop an understanding of the risk of a particular facility. The risk-based approach consists to identify the hazards, the accidental cenarius and the risks for each activities of the division [5, 6]. The hazard identification will be done by brainstorming and the risk assessment by risk matrix.

3. RESULTS AND DISCUSSION

When the work team is directly involved in analysis of the risks of their activities, they begin to have perception on what are the hazards, what can go wrong and how, what are the chances and what are the consequences. In addition, the process proposes measures to reduce the probability of accidents and measures to reduce the severity of their consequences should they occur. And this
direct involvement brings about a change in risk perception. It is expected that after risk analysis there would be an improvement in the basic elements of SC that are directly related to safety, which are: 1; 3; 4; 5 and 9. There may also be an improvement in the basic element 2, once the recommendations generated by the risk analysis are presented to senior management. The other basic elements of the safety culture: 6; 7; 8 and 10 are elements related to communication and may not be directly affected by performing the risk analysis. It is important to emphasize that, both in the preparation and in the conduct of an evaluation of the Safety Culture, the focus must always be on "capturing what is properly cultural" within the Organization's behavior and functioning, which has a greater impact on their safety performance.

4. CONCLUSIONS

The expected result is improvement the safety and of safety culture by understanding of radiation risks and hazards relating to work and to the working environment; and thus enforce a collective commitment to safety by teams and individuals and raise the safety culture to higher levels. This process should be complemented with the necessary involvement of all the IRD staff in function of the cultural change, mainly with commit of IRD Direction.

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REFERENCES


