REPROLAM

Red de Optimización de la Protección Radiológica Ocupacional en LatinoAmérica y el Caribe

NEWSLETTER

NUMBER 8, SEPTEMBER 2023.

Don't miss the opportunity to be part of this historic event in the field of radiological safety. Stay tuned to our social media channels and official website for more details about the program, speakers, and registration.

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REPROLAM ARTICLE

DOSIMETRY OSL: AN ADVANCE IN INDIVIDUAL RADIOLOGICAL PROTECTION

MR. OMAR ARIAS CURATOLO CEO OF SEROFCA / PROFESSOR AT CENTRAL UNIVERSITY OF VENEZUELA

OSL dosimetry is an advanced and widely used technology in the field of occupational radiological protection. In this essay, we will explore OSL dosimetry in detail, highlighting its characteristics and advantages that make it an excellent technology for radiation measurement.

OSL dosimetry is based on the principle of optically stimulated luminescence, which refers to the ability of certain materials to store and release luminescent energy when stimulated by a light source. In the context of dosimetry, the materials used are crystals of lithium-aluminum oxide doped with magnesium and titanium (LiF:Mg,Ti). These crystals are found in small detectors known as OSL dosimeters.

One of the main benefits of OSL dosimetry is its high sensitivity and accuracy in radiation measurement. OSL dosimeters can detect extremely low radiation doses, making them especially suitable for monitoring occupational exposure to ionizing radiation. This high sensitivity allows for a precise assessment of the absorbed dose by exposed individuals, facilitating radiation protection optimization.

In addition to its sensitivity, OSL dosimetry offers other significant advantages. One of them is its multiple-read capability, meaning that a single dosimeter can be used for multiple measurements over time. This results in increased efficiency and cost reduction compared to other dosimetry systems. Furthermore, OSL dosimeters are reusable and have a long lifespan, contributing to sustainability and resource conservation.

Another notable advantage of OSL dosimetry is its ability to measure different types of radiation. OSL dosimeters can be calibrated to specifically detect X-ray, gamma, and beta radiation, making them versatile and suitable for a wide range of applications in radiological environments. Additionally, their dosimetric response is linear over a wide dose range, ensuring precise and reliable measurements even in high-intensity exposures.

In terms of practicality, OSL dosimetry provides cumulative dose responses, meaning that dosimeters store information about the accumulated dose over a period of time. This allows for retrospective dose assessment and detailed tracking of cumulative exposure. Additionally, OSL dosimeters are compact, lightweight, and user-friendly, making them comfortable for workers and minimizing interference with work activities.

It's important to note that OSL dosimetry is supported by international regulations and standards, ensuring the quality and reliability of results. Calibration and reading procedures for OSL dosimeters are standardized and widely accepted in the scientific and professional community. This provides a solid foundation for decision-making in occupational radiation protection and facilitates data comparison among different institutions and countries.

In conclusion, OSL dosimetry stands out as an excellent technology for radiation measurement in the field of occupational radiological protection. Its high sensitivity, accuracy, and multiple-read capability make it an efficient and reliable tool for assessing exposure to ionizing radiation. Its practical features, versatility, and regulatory support position it as a preferred choice in radiological environments. OSL dosimetry plays a crucial role in optimizing occupational radiation protection and contributes to ensuring the safety and well-being of workers exposed to radiation.

THE APPLICATION PERIOD IS OPEN. THE DEADLINE FOR APPLICATIONS IS **SEPTEMBER 30, 2023.**

The Marie Skłodowska-Curie Scholarship Program aims to increase the number of women in the nuclear field, thereby contributing to the creation of an inclusive workforce composed of both men and women who participate in global scientific and technological innovation.

Selected female students will receive scholarships to pursue master's programs related to the nuclear field at accredited universities. Additionally, they are offered the opportunity to undertake an internship lasting up to 12 months, facilitated by the IAEA.

These scholarships are awarded annually to over 100 selected students, based on the availability of funds. Consideration is given to the field of study, as well as geographic and linguistic diversity.

https://www.iaea.org/services/key-programmes/iaea-marie-sklodowska-curie-fellowship-programme/information-for-applicants

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CULTURA DE SEGURIDAD

SAFETY FIRST

Space dedicated to common understanding and the promotion of Safety Culture through information, analysis, dissemination of experiences and related news.

"HOW TO ASSESS THE SAFETY CULTURE OF AN ORGANIZATION?"

One of the most debated and highly regarded topics when addressing Safety Culture is related to the evaluation and measurement of Safety Culture. In order to understand the level of an organization's Safety Culture, it is necessary to assess it and identify areas for improvement.

The assessment of Safety Culture faces two recognized challenges:

• The need to decipher and understand the fundamental assumptions of an individual or an organization, which are generally invisible, sometimes unconscious, and lie deep within the culture, yet they are the ones that determine or dominate behaviors, and
• The difficulty in directly assessing Safety Culture due to the intangible nature of its defining elements, such as values, attitudes, commitments, motivation, or prudence regarding safety.

To address these difficulties encountered in the evaluation of safety culture, approaches and methods are applied that allow conclusions to be drawn about those intangible elements and underlying assumptions of behaviors based on the analysis and evaluation of tangible, more visible, accessible, and external elements of the culture. Figure No. 1 graphically represents the approach to the evaluation of Safety Culture.

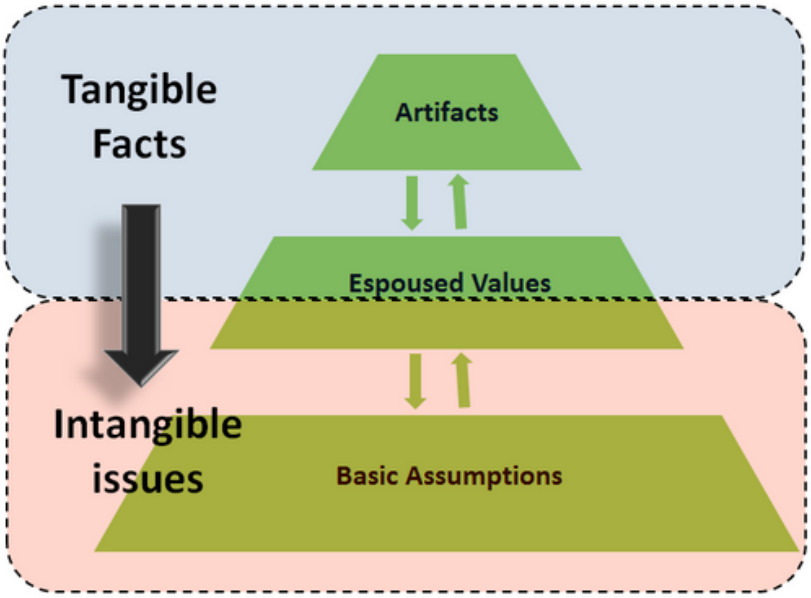

Fig. 1. Approach to Safety Culture Assessment [1]

NOW, HOW TO CONDUCT THAT ASSESSMENT?

To carry out this assessment, following the aforementioned approach, it is necessary to rely on the use of various techniques:

- Document Review
- Process Observation
- Administration of Surveys or Questionnaires
- Conducting Interviews
- Focus Group Discussions

Each of these techniques has strengths and weaknesses in terms of the information they provide in volume, quality, accuracy, and depth regarding cultural levels. Detailed information about each of these techniques can be found in IAEA TECDOC 1995 [1].

An important aspect to note is that no single technique, on its own, is sufficient to achieve valid results and conclusions about an organization's safety culture. Unfortunately, literature often presents results of Safety Culture assessments based solely on the use of surveys or questionnaires. However, the results of a survey alone are not enough to understand the fundamental assumptions behind the responses obtained. To achieve this understanding, it is necessary to rely on other techniques in a cyclical and interconnected manner until the basis of that culture is understood, in order to have an impact on it.

Figure No. 2, taken from IAEA Safety Reports Series No. 83 [2], illustrates this process of the relationship between the five techniques for conducting a safety culture assessment."

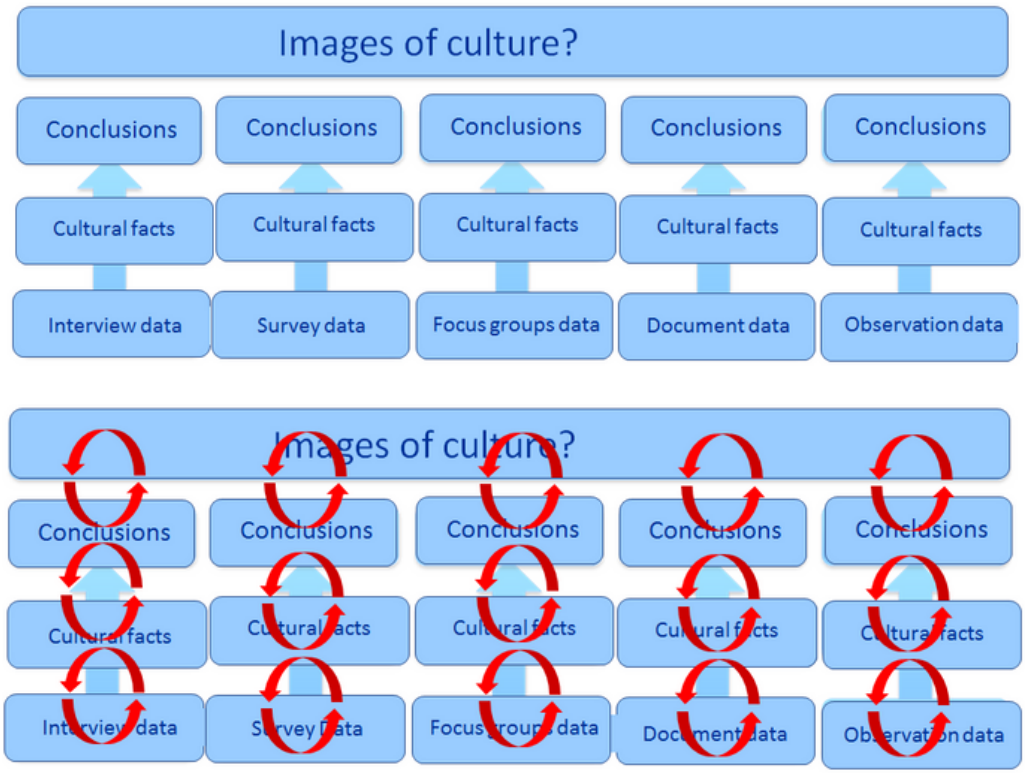

Fig. 2. Interaction and analysis cycle between techniques and stages during a Safety Culture assessment [2].

Another important aspect of safety culture assessments, which can sometimes lead to incorrect results, is understanding that a safety culture assessment is different from a safety assessment traditionally conducted in organizations. While safety assessment aims to verify and confirm compliance with established standards, safety culture assessment seeks to determine and evaluate the attitudes and behaviors of managers and workers in the organization that could undermine or reduce safety. Figure No. 3 illustrates this significant difference.

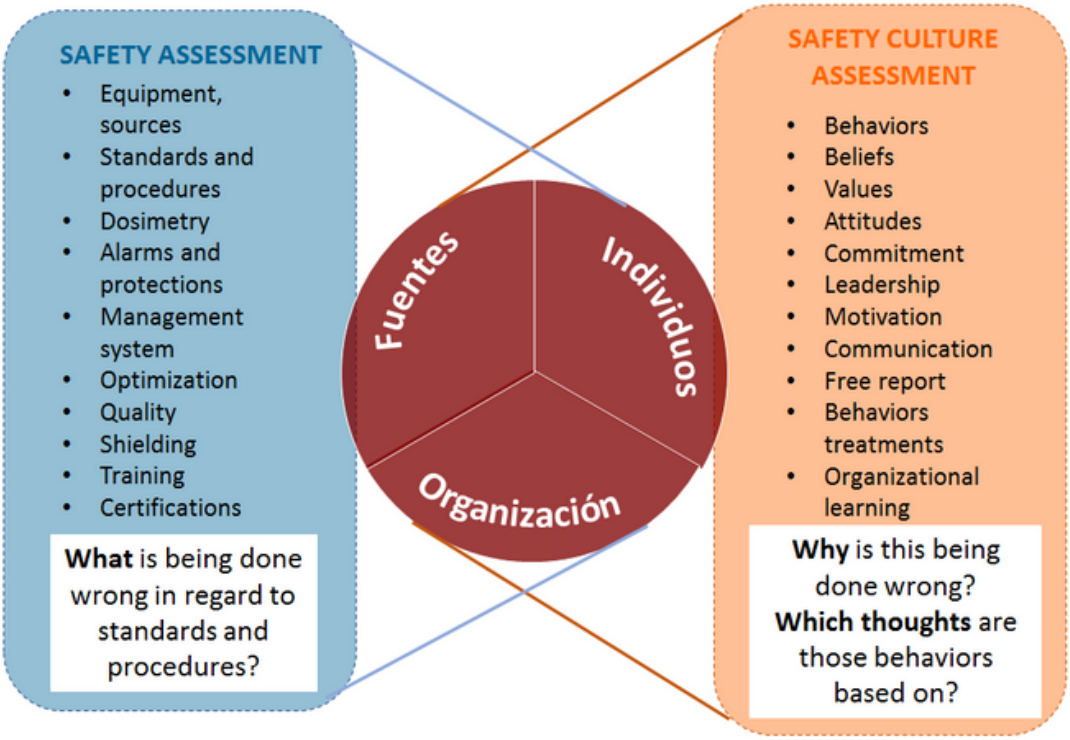

Fig. 3. Conceptual difference between a safety assessment and a safety culture assessment [1]

In future newsletters, we will continue discussing the topic of safety culture assessment and measurement.

Please remember, if you are a manager or work in promoting safety culture, that a safety culture assessment aims to capture what is cultural within an organization, the reasons behind the prevailing behaviors and attitudes toward safety in an organization. Its results are not based on a single element or test but on a combination of elements. It is different from traditional safety assessment.

Rubén Ferro
Renán Ramírez

[1] IAEA. IAEA TECHNICAL DOCUMENTS COLLECTION. TECDOC 1995 Safety Culture in Organizations, Facilities, and Activities Involving the Use of Ionizing Radiation Sources, Vienna, 2022
[2] IAEA, Safety Reports Series No. 83 Performing Safety Culture Self-assessment, Vienna, 2016.

IOMP WEBINAR: PHYSICS AND TECHNOLOGY FOR CANCER CARE – MEET THE IOMP CORPORATE MEMBERS

TUESDAY, 12TH SEPTEMBER 2023 AT 12 PM GMT; DURATION 1 HOUR

Organizer: Magdalena Stoeva
Moderator: Ibrahim Duhaini
Speakers: Axel Hoffmann (PTW) & Alexander Pegram (RadFormation)

TOPIC 1: PTW AND VERIQA RT EPID 3D AS THE APPROACH TO EPID DOSIMETRY

VERIQA RT EPID 3D is a new PTW software product for EPID patient treatment plan and delivery verification (pre-treatment and in-vivo). The result is a dose distribution in patient anatomy (based on the back-projection algorithm developed by the Netherlands Cancer Institute). The combination of a Monte Carlo algorithm and the EPID images provide a workflow-efficient and highly accurate dose reconstruction.

TOPIC 2: OPTIMIZING CANCER CARE WITH EFFICIENT QA

Ensuring the accuracy and reliability of radiation therapy machines is paramount for patient safety and effective cancer treatment in medical physics. In “Optimizing Cancer Care with Efficient QA,” Alex Pegram, DMP, DABR, delves into RadMachine, an innovative solution for Machine Quality Assurance offered by Radformation. RadMachine streamlines the QA process and enhances treatment precision, enabling physicists to perform more efficient, high-quality QA in less time.
The presentation discusses the clinical and scientific aspects of RadMachine, illustrating its seamless integration with data from therapy machines, imaging devices, and ancillary equipment, and more into a consolidated platform.

To register.: https://us02web.zoom.us/webinar/register/WN_xjvL7eB-S9eguXkbO45NMg#/registration

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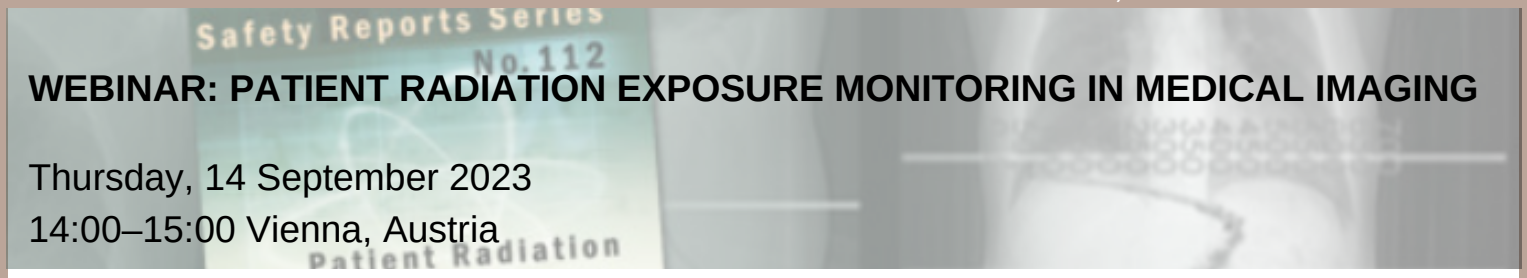

WEBINAR: PATIENT RADIATION EXPOSURE MONITORING IN MEDICAL IMAGING

Thursday, 14 September 2023
14:00–15:00 Vienna, Austria

Medical imaging, including X ray diagnostic radiology, diagnostic nuclear medicine and image guided interventional procedures, is performed with the explicit goal of obtaining useful information to support decision making about the management of patient care. Monitoring of radiation exposure of patients provides critical information for health care professionals and authorities who are responsible for ensuring a justified and optimized use of radiation in medicine. The rapid development of modern digital imaging systems and improved access to the exposure data in a digital format have facilitated patient exposure monitoring by utilizing electronic registries and automatic or semi-automatic digital systems for data collection and analysis.

With the purpose to respond to the lack of definitive guidelines on this subject, the IAEA recently published Safety Report Series No. 112, Patient Radiation Exposure Monitoring in Medical Imaging. This new publication provides consolidated information and detailed advice for setting and implementing patient radiation exposure monitoring programmes at the local or national level. The guidance applies to any systematic process of monitoring relevant patient exposure data, whether implemented manually or by automatic digital means, with an emphasis on the use of automatic patient radiation exposure monitoring systems. The Report aims to encourage the future development and use of such systems to improve access to information about patient radiation exposure, to contribute to improved implementation of the requirements for radiation protection of patients throughout the world. This includes advice on how patient exposure monitoring programmes, and especially digital exposure monitoring systems, need to be designed and used at local, national, regional or international levels towards the ultimate goal of improving radiation protection and patient care.

This webinar will provide an overview of the new guidelines.

Learning objectives

1. To clarify the main goals of patient exposure monitoring and its elements.
2. To understand the patient radiation exposure monitoring workflow and available standards for data recording and collecting.
3. To learn about analytical uses of exposure data and their use for improving patient radiation protection.
4. To summarize the essential features and challenges for the implementation of automatic patient radiation exposure monitoring systems.

Register: https://iaea.webex.com/webappng/sites/iaea/meeting/register/9efc5e80dec34e5087782be4c717ecce?ticket=4832534b00000006d3249b4121bdd661582f41dddf4bd90df8d4cd23abfd69b33a5c461c6819d990×tamp=1693667966396&RGID=rf12e4a944436deb6847f5dbf28f40dde

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The Network for the Optimization of Occupational Radiological Protection in Latin America and the Caribbean (REPROLAM) is a scientific and cultural society, non-profit, political, religious or racial, of unlimited duration, whose objective is to promote the optimization of occupational radiological protection. REPROLAM seeks to expand academic and scientific cooperation among its members, with the aim of promoting adequate radiological protection for workers.

Visit our website for more information: **http://www.reprolam.com/**
How to contact: **reprolam2020@gmail.com**