frequent occupational disease e.g. in agriculture and construction, as well as the most frequent occupational cancer of all branches. The magnitude of affected workers and recent dosimetric UVR measurements showing high annual exposures (>600 SED) are currently stimulating regulatory efforts for improved workplace prevention. The recognition of UVR induced skin cancer as an occupational disease, has proven to be pivotal to this approach.

1651d OCCUPATIONAL UV EXPOSURE AND THE EYE

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Ultraviolet (UV) and blue-light components of optical radiation can affect the eye with a photochemical mechanism; both acute and/or long term effects can be induced. By large, the most diffuse source of optical radiation is Solar Radiation (SR) that includes both components. Among factors influencing SR exposure one of the most important is outdoor work: only in Europe outdoor-workers (OWs) are about 15 million. Another factor specifically relevant to the eye is reflection as, for anatomical reasons, the eye is less protected from reflected rays. As a consequence the presence of highly reflecting surfaces, like fresh snow or water, can increase eye exposure. In OWs various adverse chronic eye effects, involving different structures of the eye, can be found, as pterygium, cataract and macular degeneration. We reviewed scientific studies on eye effects of optical radiation in OWs. The results confirm an increased risk of the abovementioned adverse effects, but knowledge on various aspects is largely insufficient. Among relevant aspects deserving further studies are the evaluation of lifetime ocular exposure to ultraviolet radiation and blue-light considering both occupational and leisure activities, and possibly integrating subjective questionnaires data with objective data, as UV effective irradiance, available through meteo-climatic databases or field measurements. Individual aspects to be adequately investigated must include among other, also the possible presence of reflection, protective habits as the use of hats (type, frequency, etc.) and of sunglasses (frequency, shape, UV/blue light filters, etc). These aspects are extremely important especially for the development of more adequate preventive measures.

1651e SOLAR ULTRAVIOLET EXPOSURE – A REVIEW OF RISKS AND PREVENTIVE STRATEGIES IN AUSTRALIAN WORKPLACES

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Introduction Ultraviolet(UV) radiation in the form of sunlight is Australia's most prevalent occupational carcinogen. It is estimated that 37% of the male working population and 8% of the female working population are significantly exposed to solar radiation at work.

Methods A review was performed of the current research literature, together with published national policies and best practice guidelines.

Results UV radiation exposure is the major cause of melanoma and non-melanoma skin cancer (NMSC). Australia has the highest incidence of melanoma in the world and skin cancer accounts for over 80% of all new cases of cancer diagnosed each year. Although sun protection is used by 95% of those exposed at work, only 9% are fully protected.

A 2015 study estimated that 7220 melanomas occurring in Australia in 2010 could be attributed to UV radiation exposure. The incidence of melanoma in those under the age of 25 is stable and is believed to be due to improved sun protection behaviours from education programs, although it may partly relate to the change in the population racial mix.

Evidence shows that a wide range of measures can be effective in reducing the impact of skin cancer. Australia now has extensive prevention programs and it has been estimated that the return on a national skin cancer prevention media campaign is approximately $2.32 for every dollar invested, through reduced healthcare costs.

Conclusion This review summarises the impact of UV exposure on skin cancer prevalence in Australia. The policy priorities include reducing UV exposures, education programs and early intervention. These strategies also have the potential for broader applicability in the prevention of other occupational risks.

1651f ILO ACTIVITIES FOR THE PREVENTION OF THE RISK RELATED TO OCCUPATIONAL EXPOSURE TO SOLAR UV

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Introduction Excessive exposure to solar UV radiation is a relevant risk factor for outdoor workers, inducing various acute and chronic adverse health effects. In particular chronic exposure can cause skin and eye cancer mainly by DNA mutations induction (e.g. in the p53 tumour suppressor gene and telomerase gene) and immunosuppression. The protection of the worker against sickness, disease and injury arising out of employment is one of the tasks assigned to the International Labour Organisation (ILO) in the Preamble of its Constitution: the protection against risks from UV exposure falls naturally within these tasks. The ILO uses various means of action to give governments and employers' and workers' organisations the necessary help in drawing up and implementing programmes for the control of workplace risk factors, including solar UV, as international standards in the form of legal instruments, codes of practice, practical manuals, training materials and education and training and technical cooperation. Examples are the Safety and Health in Agriculture Convention (No. 184) and Recommendation (No. 192), and the List of Occupational Diseases Recommendation (No. 194). Specific sections devoted to UV protection are included in the ILO codes of practice on Safety and Health in Agricultural Work, and on Ambient Factors in the Workplace. The ILO also produces guidance documents in collaboration with the ICNIRP and the WHO on workplace UV protection: they provide guidance on workplace safety and health measures and procedures that will lead to higher standards of safety for all personnel engaged in the operation which gives rise to occupational exposure to UV. Furthermore, the ILO collects information on good workplace practice on protection of workers against UV radiation and on the identification and recognition of diseases as occupational caused by UV, and provides support for the applications of the relevant ILO instruments in member States.

876 RADIOLOGICAL LICENSE TYPE I-C INSTALLATIONS IN MEXICO

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Introduction To carry out the licensing process for facilities classified as Type C, in Mexico, the Procedure:Manual on Radiological Safety must be submitted to the COMISION DE SEGURIDAD NUCLEAR Y SALVAGUARDAS (CNSNS) Nuclear Radiological Safety National Comission which should include general specifications of the installation, to demonstrate that the characteristics of Radiological safety are according with the requirements and include a radiation safety policy, which will apply during the operation, the termination of operations.
Methods According with the Mexican standard and the CNSNS the company should work to implement all the procedures and requirements, first stage include paperwork and external training, the next stage include implementation policies and internal audit, all the documents are send to de government an external visit could be request to demonstrate all the requirements.
Results The radiological safety program will be successful according to the proposed activity risk analysis and emergency plan, and include a failure analysis. With an adequate implementation program, health and environmental radiological monitoring program the organisation should determinate potential risk to release radioactive material out of the facility, and demonstrate that radiological risks resulting from the cessation of operations will be appropriately managed in such a way as to ensure the safety of personnel occupationally exposed, the public and the environment
Conclusion With an adequate program the company will be able describe the design aspects, engineering works, systems, equipment and devices that allow safety operations with radiation sources and minimise the exposure of personnel to radiation and the production of radioactive waste, Containment necessary to limit the release of radioactive material. Estimate dose equivalents, exposure routes and exposed personnel medical control.

124 OCCUPATIONAL EXPOSURE TO RADON: AN UNDERESTIMATED RISK IN VIEW OF THE COMBINED EXPOSURE TO OTHER OCCUPATIONAL AND ENVIRONMENTAL LUNG CARCINOGENS

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Introduction Radon is a well-established human carcinogen, targeting the lung. A lot of epidemiological studies conducted on both uranium miners and general population in dwellings provided a risk quantification due to radon exposure, by alone and in combination with tobacco smoke. However, little is known about the risk due to combined exposure to radon and other occupational and environmental lung carcinogens.
Methods Literature review to identify the most critical scenarios of combined exposure to radon and other lung carcinogens, providing a framework for the risk assessment and addressing the planning of epidemiological studies.
Results The combined exposure to radon and other lung carcinogens may be relevant for several indoor working environments. However, it is important to keep in mind that for a number of workers a combined exposure may occur in a sequential way, i.e. to radon in indoor settings and to outdoor carcinogens if the job/s are conducted at least in part outdoor. Apart the tobacco smoke, co-exposures of interest include asbestos, crystalline silica, polycyclic aromatic hydrocarbons, hexavalent chromium, nickel and outdoor air pollution, all extensively assessed in both epidemiological and/or experimental studies.
Discussion Prevention of lung cancer occurrence in radon-exposed workers has not only to take into account the long-term indoor radon concentrations, as obtained by conventional dosimetric assessment, and the smoking status of the worker, but must include an accurate assessment of the patterns of exposure to other lung carcinogens, both ubiquitous and typical of a particular occupational or living setting. Unfortunately, validated biomarkers of exposure, early biological effect/s and individual susceptibility are not available in this regard and different lung carcinogens display different kinetics and may act through several distinct (although partly overlapping) cellular and molecular pathways, both genetic and epigenetic. The development of 'omics' approaches represent a promising tool to address this topic.

1322 EXPOSURE TO STATIC MAGNETIC FIELDS AND DISTURBANCES OF ACTIVE IMPLANTABLE MEDICAL DEVICES

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Introduction According to Directive 2013/35/EU for magnetic fields from 0 to 1 Hz, the exposure limit value (ELV) for sensory effects due to magnetic flux density is 2 T (Tesla) and 8 T for limbs. Interference with active implanted devices, e.g., cardiac pacemakers, starts at an action level (AL) of 0.5 mT. Interference can influence the functioning of medical devices. The aim is to describe some examples of static magnetic field exposure and calculations to evaluate the possible risk of disturbances to medical devices.
Methods We measured and analysed field values on the surface of magnetic objects and how the exposure to static magnetic fields decreased when the distances of the source increased. The used metres were based on Hall effect sensors; Holaday Industries HI 3550 or Extech MF100. Then, we compared theoretically measured values to the abovementioned directive levels.
Results Static magnetic flux density can be high (e.g., 20–200 mT) at the surfaces of magnets, and magnetising fields can be very high (0.5–3 T). However, the distance attenuation decreases the flux rapidly; for example, at a distance of 1 cm from the cable, the field can be 2.5 mT (shielded cable, current 400 A), but at a distance of 10 cm, 0.5 mT (AL for active implanted devices), and 30 μT at a distance of 1.0 m.