

B. PERFORMANCE STANDARDS

B5. RADIATION

1.0 Scope

This Standard is applicable to workplace radiation issues associated with process monitoring, products or waste streams, and includes both ionising and non-ionising radiation. It covers radiation hazard evaluation, programme design, exposure controls and employee information, to ensure that employees, contractors and third parties will not suffer adverse health effects from radiation sources either used or generated by the Business.

2.0 Programme Design – All Types of Radiation

- 2.1 The risk associated with ionising (from both naturally occurring radioactive mineral (NORM) and radon, and man-made sources), ultra violet (UV) and electromagnetic field (EMF) radiation exposure must be assessed.
- 2.2 There must be an inventory of all types of radiation sources that have a potential for adverse health effect, and should include radiation source type, type of radiation (eg. radioisotope, radon, EMF, laser, etc.), strength and unit/material location.
- 2.3 Where risk assessment indicates the need, a documented radiation management programme must be developed such that:
 - (a) All types of radiation sources that could contribute to the exceedance of OELs are adequately characterised and described;
 - (b) Such exposures can be reduced to as low as reasonably practicable (ALARP);
 - (c) The relevant requirements of the A Standards are met;
 - (d) It provides a clearly defined chain of responsibility, with duties and responsibility documented; and
 - (e) Education is provided for employees and contractors regarding radiation safety, including the radiation management programme elements.

3.0 Programme Design – Ionising Radiation

- 3.1 The ionising radiation management programme must meet all applicable regulatory requirements, and if applicable, include at least the following elements:
 - (a) Surveyed radiation areas and quantification of exposure sources/levels;
 - (b) Exposure and medical monitoring programmes based on established investigation levels;
 - (c) Transport of radioactive materials in compliance with international radiation transport regulations, when no local regulations are in place;
 - (d) Waste monitoring and disposal programmes;
 - (e) Feedstocks and equipment checks for naturally-occurring ionising radiation;

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- (f) Clearance and control procedures for all materials and equipment leaving site (including scrap);
 - (g) Leak (wipe) tests on sealed radioactive containing equipment;
 - (h) Mine ventilation with specific reference to radiation protection (for underground mines);
 - (i) Water management and air emission control;
 - (j) Lock-out procedures for vessels and equipment containing radioactive sources and radon decay product measurement prior to entry;
 - (k) Emergency procedures;
 - (l) Environmental impact risk assessment (air, water, waste, foods, etc);
 - (m) Product/waste life cycle control; and
 - (n) Dose assessment for employees and a critical public group, according to documented methods and by an appropriately qualified person.
- 3.2 Areas with ionising radiation with annual doses greater than 5 milli Sieverts (mSv) must be designated as restricted access or controlled areas. These areas must be identified and mapped, signposted or otherwise clearly communicated to employees working in the area.
- 3.3 All underground operations must have conducted a baseline radon survey using passive area monitoring techniques. All underground operations with an identified radon issue must conduct similar surveys once every two years. Areas with levels greater than the International Commission on Radiological Protection (ICRP) action levels must be designated as restricted access or controlled areas.
- 3.4 These designated restricted areas will require the development of engineering controls. Signposting, where necessary, must use appropriate wording or symbols on signs to identify the hazard.
- 3.5 Each person whose potential exposure exceeds 5mSv per annum or who is a designated radiation worker must undergo periodic personal radiation monitoring and medical examination that is reviewed by the medical adviser. The results must be discussed with the worker.

4.0 Exposure Controls

- 4.1 Exposure control for any type of radiation must include some form of control of the process from which the radiation is emitted (eg. use a lower energy source, shielding or isolation), a limitation on the time spent in close proximity to strong radiation sources, and training as to the location of sources and what to do about them.
- 4.2 All sources for ionising radiation must be managed in use and disposed of or securely stored in accordance with local regulations. Each site where individual worker's exposures could exceed 5 mSv per annum must have a trained radiation protection adviser in post or ready access to a trained protection consultant.

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- 4.3 There must be documented procedures for inspection, assessment and maintenance of the controls, as well as emergency procedures to deal with incidents involving ionising radiation sources (including fire and explosions). All controls must be reassessed annually to ensure their continued effectiveness and that operating practices are in accordance with written procedures.