International Organisation for Standardisation (ISO) Update - AS ISO 14520 Part 1 – General Requirements Overview

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In the last issue of GasBag we discussed the system-specific parts of Australian Standard (AS) ISO 14520. In this issue we look briefly at the main document, AS ISO 14520 Part 1 – General Requirements, Gaseous fire extinguishing systems - Physical properties and system design.

AS ISO 14520 incorporates the concepts of 'no observed adverse effect level' (NOAEL), the highest concentration at which no adverse toxicological or physiological effect has been observed, and 'lowest observed adverse effect level' (LOAEL), the lowest concentration at which an adverse toxicological or physiological effect has been observed. These concepts are related to safety precautions for normally occupied and normally unoccupied areas (the need or otherwise for time delay devices, automatic/manual switches or lock-off devices). It also requires systems to be adequately bonded and earthed to minimise the risk of electrostatic discharge and, in electrical substations, switchrooms and the like, to prevent the metalwork becoming electrically charged.

AS ISO 14520 outlines automatic detection, system actuation and control equipment requirements (modified in AS ISO 14520 to suit Australian practice). Balanced and unbalanced piping system flow calculations are addressed, as are agent concentration requirements for Class B fuels, Class A fuels and 'higher hazard Class A' fuels (e.g., electrical and electronic type hazards involving grouped power or data cables in computer and control room under-floor voids, telecommunication facilities, etc.). Performance requirements are spelled out for both liquefied and non-liquefied extinguishant systems.

A series of Annexes, B through H, provide important technical information.

- Annex B deals with the cup burner method for determination of flame extinguishing concentrations of gaseous extinguishants; vitally important in terms of system design calculations.
- Annex C covers the distribution of extinguishant through piping and nozzle networks, together with protocols for heptane pan, wood crib and polymeric fuel fire tests; the latter using acrylonitrile-butadiene-styrene (ABS), polypropylene and polymethacrylate fuel arrays.
- Annex D sets out a standard method for evaluating inerting concentrations for gaseous fire extinguishants.
- Annex E provides information for establishing the integrity of rooms and enclosures with respect to maintaining the extinguishant concentration for the relevant period (referred to as the 'hold time'). Hold time is generally specified to be not less than 10 minutes.

- The Annex also details a test procedure (the so-called 'door fan test') for predicting hold time in any given enclosure. Extensive mathematical treatment provides the basis for a variety of computerised analyses.
- Annex F recommends inspection routines designed to assure ongoing system performance (Refer to AS 1851).
- Annex G addresses safe personnel exposure guidelines. Among other things it discusses hypoxic effects and introduces pharmacokinetic (PBPK) modelling; a computerised tool that describes time-related aspects of a chemical's distribution in a biological system. The PBPK model mathematically describes the uptake of a halocarbon into the body where adverse effects can occur.
- Finally, Annex H outlines a recommendation for developing a flow calculation method of predicting system flow parameters.

AS ISO 14520 incorporates requirements designed to eliminate the need to release extinguishant during testing and commissioning procedures (linked to enclosure integrity testing).

Installation of new or modifications/additions to existing detection, actuation and control systems, associated with a fixed gaseous fire suppression system shall only be completed by a person holding an Extinguishing Agent Handling Licence (EAHL) (Entitlement 6) and comply with the relevant parts of AS ISO 14520 or the appropriate international standard.

An EAHL (Entitlement 6) is not required for installation activities prior to connection or commissioning of detection and control systems. However, an EAHL (Entitlement 6) holder shall inspect a system before connecting or commissioning the detection and control systems.

In the next edition of Gasbag we will be taking an in-depth look at Part 5, 6, 8 and 9.

A copy of the standard can be purchased through SAI Global (**Click here**) or visit SAI Global's website: **http://infostore.saiglobal.com/store/**.

How do I contact the Fire Protection Industry (ODS & SGG) Board or find out more about the fire protection industry permit scheme?

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