



**STATEMENT ON DISPOSAL OF DOMESTIC SMOKE DETECTORS
July 2011 (updated from November 2001)**

At its meeting of 13-14 July 2011, the Radiation Health Committee considered its 2001 statement on the disposal of domestic **ionization chamber smoke detectors** (ICSDs) found in smoke alarms. The statement has now been updated to take into account the adoption by the States and Territories of its 2001 advice and to specifically address the increasing use of resource recovery technologies.

The Committee concludes that:

- The small amount of radioactive material in ICSDs is not a health hazard
- Small quantities (ten or less) of domestic ICSDs should be disposed of via normal household waste to go to landfill and not in the recycling bin
- Domestic ICSDs do not need to be collected and returned to suppliers or health department radiation protection authorities.

ICSDs contain small amounts of radioactive americium-241. Treatment and disposal as radioactive waste of small numbers of domestic ICSDs would be inappropriate since they present no health hazard when disposed of to landfill. However, when significant numbers of domestic ICSDs (or more particularly, the sources) are collected together for bulk disposal, they can trigger regulatory requirements to be treated as radioactive waste. In this case, they may need to be returned to the supplier or other company authorised to accept radioactive waste.

Historically, jurisdictions advised that ICSDs should be collected and returned to either the health department or the supplier for disposal. This advice was incorporated into the Australian Standard¹ AS3786-1993 *Self-contained Smoke Alarms*, which included a requirement for ICSDs to be labelled accordingly.

Detailed assessments of the radiation risks of domestic ICSDs^{2,3,4} have been carried out. In November 2001, the Radiation Health Committee issued a statement that small quantities of domestic ICSDs should be disposed of to household waste and not collected or returned. All State and Territory radiation protection authorities in Australia now advise that small quantities of domestic ICSDs should be disposed of to household waste.

The reasons for removal of restrictions on disposal of individual domestic ICSDs include:

- The amount of radioactive material (americium-241) in each ICSD is extremely small (less than 40 kBq or 1 μ Ci), and from environmental and public health perspectives its disposal with domestic rubbish does not represent any hazard.
- The radioactive material is securely bound in a metal foil within the detector.
- The amount of naturally-occurring alpha-emitting radioactivity in normal soils is equivalent to a dozen or more ICSDs in every cubic metre. The dispersal of ICSDs, even in large numbers, through landfill sites is not significant in comparison.

This approach is also consistent with international practice, such as in the UK⁴ and New Zealand⁵ where there are no longer any restrictions on the disposal of domestic ICSDs. AS3786 was amended in 2004 to remove the labelling requirement regarding collection and return to supplier or Department of Health.

Increasingly local authorities have resource recovery arrangements for their domestic waste. If ICSDs appear in recycling streams then they should be redirected to landfill. For facilities that directly treat household waste, such as Alternative Waste Treatment facilities, operators might need site specific arrangements similar to those used for other non-putrescible items and heavy metals.

The handling by waste industry workers of ICSDs presents no health hazard, even if the source becomes separated from the casing.

The Committee notes that there are operational performance factors that might influence the choice between photoelectric detectors (which do not contain radioactive material) and ICSDs. Advice should be sought from fire authorities regarding appropriate fire safety arrangements.

Conclusions

- The Committee believes that the small amount of radioactive material in an ICSD is not a health hazard.
- Domestic ICSDs should be disposed of in small quantities (ten or less) via household waste to go to landfill.
- The relevant Australian Standard was amended in 2004 to remove the labelling requirement indicating that ICSDs should be collected and returned to the supplier or Department of Health.
- Where household waste is subject to resource recovery (recycling), ICSDs should go to landfill.

¹ Standards Australia, AS 3786, *Self-contained Smoke Alarms*, 1993 (as Amended)

² Robertson MK, *Domestic Smoke Detectors - A Safe Investment*, NZ physicist, March 44-48, 1990.

³ Carter MW, *Domestic Smoke Detectors - A Radioactive Waste Problem?*, IRPA 9: 1996 International Congress on Radiation Protection. Proceedings, vol. 3, pp 311-313.

⁴ National Radiological Protection Board (UK), Documents of the NRPB, vol. 3, No. 2, 1992.

⁵ National Radiation Laboratory, Robertson MK, *Radioactive Waste Disposal – Policies & Practices in NZ*, NRL Report 1996/2.