



Using our brains to save and improve the lives of workers

A background image showing a microscopic view of several cells. The cells are roughly spherical and have a complex, multi-layered structure with various internal components and membranes. The colors are primarily shades of green and grey, with some darker areas. The cells are arranged in a cluster, with some overlapping. The overall appearance is that of a biological or chemical structure.

## Drug Enforcement for the Home Office Scientific Development Branch

## The Client

Home Office Scientific Development Branch (HOSDB) are responsible for provision of technical support and guidance to UK Police forces and the Serious Organised Crime Agency (SOCA).

## The Problem

There is a new and increasing risk in the UK from illicit drug laboratories (IDLs), which present many chemical hazards to the police, fire services and other law enforcement professionals. Methylamphetamines and their by-products are of particular concern. HOSDB, SOCA and the Metropolitan Police Service (MPS) are developing operational advice and guidance for police officers who need to enter IDLs. To support this guidance, HOSDB commissioned HSL to help them set national guidelines for the appropriate selection and safe use of Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) at IDLs.



## What We Did

In consultation with HOSDB, SOCA and MPS, we carried out a chemical hazard and risk analysis alongside a practical study of PPE protection factors. We collected information on the chemicals which were likely to be present in IDLs and estimated worst-case concentrations of the hazardous materials. We then assessed the protection factors needed in such cases for both respiratory and skin protection, and identified the PPE (coverall, gloves, boots) and RPE most likely to provide the necessary degree of protection.

We used practical studies to assess the interaction between the user, the PPE in use by the police and the chemical hazard, enabling us to gauge the real protection levels offered by various PPE options. We measured PPE and RPE performance in our specialist containment chamber using simulated work tasks that represented a realistic IDL working environment. These experiments took account of the different phases of an IDL enforcement intervention operation, such as entry into premises, evidence logging, removal of material, disposal of remaining hazards and decontamination. We identified specific problems with the interface between the RPE facemask and the PPE coverall's hood, which could lead to skin protection levels below those required. We then identified and sourced a different coverall and another RPE respirator option to overcome these problems, working closely with SOCA and MPS to overcome particular difficulties associated with the compatibility of individual items of PPE when worn as an ensemble.

## Outcome/Benefits

Our testing showed that the RPE-hood interface of the new coverall used with suitable RPE provided greatly improved protection for IDL tasks. This protection exceeded the necessary skin protection levels that we had identified from our hazard analysis. We developed practical and cost-effective solutions to overcome identified shortcomings related to equipment interface problems, resulting in improved reliability of protection for enforcement officers.

We delivered a full report which documents the hazard analysis, our assessment of the required respiratory and skin protection levels and our measured 'workplace protection factors' (WPFs) for various PPE/RPE ensembles. HOSDB is now using this report and our recommendations to inform their guidance to police officers on the selection and safe use of appropriate PPE/RPE ensembles for IDL work. Police working in IDL environments are now adopting the PPE coverall and RPE options that we suggested, with our measured WPFs providing confidence in the level of protection that these options offer.