Hidden **hazards**

A series of lectures on fire safety with hazardous substances scores well in the shock and awe stakes. But plant engineers ignore the lessons at their peril, writes Brian Tinham

Did you know that if dry wire wool – think of discarded Brillo pads – comes into contact with a dead nine-volt battery, it can spontaneously combust? Or that dust – for that matter, even sugar or custard powder – can ignite and unleash a fireball? Or that air enriched with just three per cent oxygen is lethal – burning everything in its path at twice the normal rate?

RoSPA (the Royal Society for the Prevention of Accidents), along with hazardous products storage specialist Denios, is running lectures on the subject, with the aim of promoting safe practice. Denios managing director Roy Smith claims they're not just about shock tactics. They are, he says, designed to get engineers rethinking their responsibilities under DSEAR (Dangerous Substances and Explosive Atmospheres Regulations 2002) and revisiting risk assessments in line with the new Health & Safety at Work (Offences) Act 2008.

"Our reason for promoting these lectures is that UK standards for chemical storage are five years behind Europe – and that can be very dangerous," insists Smith. "So, in Germany, plant owners are legally bound [under DSEAR] to use 90-minute fire-rated cabinets for internal storage of flammable substances. In the UK, the ruling provides for just two-to-three minutes' protection."

Poor testing

How has that arisen? Smith explains that best practice under DSEAR calls for storage of flammable chemicals externally in single-skin steel cabinets, tested under the old BS 476, covering fire safety for building materials and structures. "But validation was only done on the materials [which pass a 30 minute test, although only at 750°C, whereas fires reach 1,200°C], not the cabinets and their pop rivets, which melt at 690°C," he says.

The more recent standard (BS EN 14470-1:2004) calls for internal flammables storage in cabinets able to withstand 1,100°C for the full 90 minutes. They must also stay closed, locked and sealed, so there is no passage in or out for hot gases or flames. Additionally, internal surfaces must not exceed 180°C in that time. "France and Holland have already insisted that the 90 minute internal storage and 30 minute external storage tests must be conducted on the cabinet, not just its materials, but the UK is yet to follow suit," says Smith.

Meanwhile, he also worries that in the UK there is too little joined-up thinking between the HSE and the Environment Agency – suggesting that, from a risk assessment perspective, managements have been allowed to look almost exclusively at fire hazards as dangers to human health and/or ongoing company operations, not environmental damage. "It's only in recent months that environment officers have been given powers to slap enforcement notices on organisations where they fear that pollution could result from a fire involving hazardous substances," he states.

What can you do? Good practice calls for revisiting your risk assessments and re-evaluating handling and storage, particularly where 50 litre (or above) drums are involved. Most important, conduct those assessments with representatives from across the organisation.

Smith tells of one site, where isopropanol (a flammable gas, heavier than air) was being used in an upstairs laboratory. "Although procedures in the lab met good practice, the door to a stairwell was not sealed. Looking down the stairwell, we found people smoking just outside. The potential for ignition and an explosion was huge: it would take nothing for ignition and flashback into the lab."

The Denios/DSEAR lectures cover: legal issues; how danger arises; flashpoints; fundamentals of explosions, deflagrations and fires; and risks resulting from improper handling and/or storage. For lecture dates and venues, contact your RoSPA local health and safety group. PE

Pointers

- Plant engineers need to revisit risk assessments and storage provision in light of the Health & Safety at Work (Offences) Act and DSEAR
- UK flammable substances storage standards still lag many in mainland Europe
- UK validation standards used for fire-rated cabinets do not offer real safety
- Even common industrial substances are more flammable than many realise
- RoSPA and Denios are running UK-wide lectures explaining good practice

Commonly available substances can ignite easily. Look for professional storage cabinets