July 2001
Issue 3

INCIDENTS AND ACCIDENTS TO DATE		
Incident	***Type***	***Date***
Fall from platform	Fatality	1997
Gas exposure	Hospitalisation	1998
Fall through fragile roof	Near miss Hospital treatment	2000
Scaffold collapse	Near miss Equipment damaged	2000
CO exposure at steel works	Near miss	2000
Steam release by sampling platform	Near miss	2000
Fall from ladder	Hospitalisation	2000
CO exposure	Near miss	2001
Fall through platform	Fatality	2000

Scafftag Categories

Very light duty	to 0.75 kN/m^2 (75kg/m^2)
General purpose	to 2.0 kN/m^2 (202kg/m^2)
Heavy duty	to 2.5 kN/m^2 (252kg/m^2)
Special purposes	must state safe kN/m^2

HEALTH & SAFETY *BULLETIN*

Source Testing Association

The Health & Safety Bulletin is a means of disseminating important issues relating health and safety of professionals involved in air emission monitoring and allied fields.

To contribute to this publication please e-mail H&S@s-t-a.org with your suggestions or article

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Health and Safety Briefing

The STA is subscribing to this fortnightly newsletter produced by Croner. CCH Group Ltd. In each newsletter we will publish the contents list of each newsletter that is on file.
If you would like copy of any particular issue please contact Samantha.

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ARE YOU USING BLUE INDICATING SILICA GEL?

ARE YOU AWARE OF THE NEW EEC DIRECTIVE?

Read on!!!!!!

TOXIC

Blue Indicator in Silica Gel

There is now a move away from this traditional self-indicating silica gel following European Commission Directive 98/98/EC (amendment to 67/548/EEC) reclassifying cobalt chloride as a potential carcinogen by inhalation. Subsequently, the latest British Chemicals (Hazard Information and Packaging for Supply) Regulations CHIP 99(2) now include cobalt chloride in the Approved Supply List (Fifth Edition) for the first time.

This regulation came into effect as of 1st July 2000, resulting in a number of changes. Labelling on most containers of self-indicating (blue) silica gel are being modified by suppliers according to the new regulations. This will include a TOXIC symbol and the risk phrase 'May cause cancer by inhalation'. Make sure you get a new safety data sheet from your suppliers

These new regulations have led to the worlds main silica gel producers launching new indicating silica gels with 'environmentally friendly' indicators. **Orange self-indicating silica gels are now available**. These use iron compounds as their indicators and change to colourless as they adsorb moisture. They are classified as safe materials and are suitable for repeated regeneration and reuse.

Operator Monitoring Assessment

The Environment Agency has developed an Operator Monitoring Assessment (OMA) scheme as part of its effort to focus monitoring resources in a more targeted way. The scheme is a risk-based audit, designed to enable Site Inspectors to quantitatively assess the quality of the emissions to air monitoring undertaken by Agency regulated process operators as a condition of their authorisations.

The scheme is based on key areas identified by an Agency working group. An audit structure was developed early in 2000 and the scheme was trialed at 45 industrial sites representing a wide range of industry sectors. These trials enabled the draft scheme to be developed and OMA has been put out to public consultation until May 7th 2001. The consultation document is available on the Agency web site at www.environment-agency.gov.uk/consultations. The scheme is scheduled for implementation towards the end of 2001. It is planned that 25 % of industrial process would be assessed in 2001/ 02 and the remaining 75% assessed during 2002/ 03.

The OMA scheme is consistent with "the polluter pays" principle, in that sites scoring well are likely to receive less Agency check monitoring than sites scoring poorly for their monitoring effort. The scheme should therefore act as a driver towards higher-quality operator self-monitoring, which is consistent with the aims and objectives of the STA. The Agency expects to place a greater reliance on self-monitoring as its transparency and quality improve.

Another key benefit so far as STA members are concerned is that health and safety is an integral part of the assessment scheme. OMA consists of five "attributes" (see Table) each containing a number of "elements" that are pertinent to high-quality monitoring. Health and safety is identified as one of the "fundamental elements" of good monitoring. If a company scores badly for a fundamental element then the operator is required to take relevant action to rectify the problem.

The current version of the OMA scheme comprises of the following five attributes:

OMA 1	Management and training of staff
OMA 2	Fitness for purpose of monitoring methods
OMA 3	Maintenance of monitoring equipment
OMA 4	Calibration of monitoring equipment
OMA 5	QA/QC of monitoring effort

To some degree each of these attributes has a safety implication in that well managed and good quality monitoring reduces the stress aspects of the site work that is so often a factor in accidents.

Each of these attributes is divided into a number of elements and these are scored individually. The specific elements, which relate to health and safety are given in the table below.

Attribute	Element relating to Health and Safety	Requirements to achieve a good score
OMA 1 Management and training of staff	Element (h) of this deals with the health and safety management and training of staff.	A good score for this attribute would be obtained if the operator has formalised safety management system, safety induction training for staff and contractors and risk assessments to identify the specific risks for each job. Control measures would be introduced to reduce any identified risks to as low as reasonably practicable. The risk to stack personnel once control measures are in place would be deemed to be low
OMA 2 deals with the fitness for purpose of the methods, equipment and sampling platform	These all have health and safety implications although there is no specific health and safety element to this attribute	The nature and size of the platform would be considered here and the suitability of the equipment for the stack. Aspects of manual handling, hazardous area and confined space legislation should be considered in assessing these points
OMA 3 considers the maintenance of the equipment to be used	This again has no specific health and safety elements but certainly the electrical safety of equipment is a key factor in this attribute.	The equipment should have records showing it is regularly inspected and has up to date electrical safety tests.
OMA 4 assesses the calibration of the equipment	No specific safety elements	No specific health and safety implications
OMA 5 the quality aspects	No specific safety elements	Quality accreditations (e.g UKAS, MCERTS) are required to obtain a good score and these have safety implications in the training and auditing of site staff

The first OMA audits are due to begin in September this year.

Therefore it is now that process operators and monitoring organisations should be considering the potential implications of this scheme, as stack emission monitoring work beingundertaken now maybe assessed under OMA.

References

ENVIRONMENT AGENCY (2001) Guidance for business and industry. Operator Monitoring Assessment (OMA). Consultation Document. London: EA <http://www.environment-agency.gov.uk/epns/conmon.html (accessed 20 February 2001)

FOOD for THOUGHT

Peter Williams,
Tornado Technologies Ltd

This article was published in the EMC & Compliance journal at the beginning of the year. For seasoned samplers it is plain that it was written for those not familiar with the process; interestingly most aren't. It's probably equally true, that those sampling are not familiar with the arcane world of Electromagnetic compatibility. This is now governed by statute and a sizeable industry has built up around it throughout the world. It is equally true to say that the interaction between electrical and electronic devices and people is becoming increasingly important. The light hearted approach on the basis of not taking yourself or what you do too seriously does not detract from the serious implications.

As I pen this article by a log fire, with outside covered by natures seasonal nocturnal white blanket it occurs to me that Electromagnetic Compatibility and related matters can be influenced by The British obsession: the weather. Over a period of time certain situations have arisen that show that EMC is just as much making things work as debating the finer points of EN61000-X-X and, does have direct influence on safety.

Our business is obscure to most, the design and manufacture of Scientific Equipment for sampling dust from chimneys and flues. It is a multi-disciplinary compelling subject which for most will demand a brief explanation. The picture shows The pioneer researchers over forty years ago collecting dust samples to determine the particulate effluent from the stack they are testing. They are inserting a nozzle into a stack and drawing out gases to collect the entrained dust particles, it also clearly indicates that protective clothing in those days was somewhat more stylish than today. Plainly this activity is not for the faint hearted or of a sedentary disposition and putting a foot wrong can have terminal consequences.

So that a representative sample can be collected, indicating the quantity of dust expelled from a stack: the gases drawn into the nozzle have to be at the same velocity as those travelling up the stack, that is, isokinetic. Achieving this represents a considerable challenge and it is very easy to get it wrong and have to repeat a test. Unlike those in the picture, today we have handheld computers and other electronics to guide us through tests and take measurements.

We received a telephone call from a fire chief who was trying to rescue a member of a sampling team who had collapsed up a stack. He wanted to know certain aspects about our equipment that the other team members couldn't answer. It transpired that he was hypoglycaemia, that is blood glucose levels too low. This puzzled us because the individual in question is clear thinking, an ex-pit deputy and manager with many years experience of dust sampling both in mines and chimneys. The conclusion by all concerned was that it was " one of those things", this incident persuaded us to set up a dedicated help line.

A letter from the health and safety executive told us that an individual had almost fallen from a stack; a height that would have certainly been fatal, due to an electric shock. The implication was that our equipment was responsible. Our equipment runs from 110V centre tapped, that is, two phase, any voltage over 130V it switches off and disconnects itself from the supply via relays on both phases, it is able to withstand inputs up to 415V. The cables are flexible armoured using BS4343 connectors and built with metal boxes at least 4.5mm thick in short; belt, braces, garters and string.

Upon investigation the accident occurred with the equipment disconnected as the team were packing up and lowering equipment down the stack. The individual had been diagnosed as having suffered an epileptic fit which to us seemed strange for a young, fit and healthy individual. This was a double blow to the person concerned as it not only put into question him dust sampling but his private pilots licence as well. The weather at the time was zero wind speed and temperatures well below freezing. At this stage officialdom lost interest as there was no simple reason for the incident and we too where completely puzzled.

Within a few days of this, the author was using a well know brand of suction cleaner and there was a most impressive and unexpected pyrotechnic display from the aluminium pipe. Upon inspection, where one was flared so the other could couple into it there was a plastic liner, some experimentation could generate this effect at will. Generally it doesn't happen as the tube is held and the resistance of the user effectively stops the build up of static electricity.

Enquiry indicated that at the time of the incident equipment was being lowered by rope and pulley, although we were assured that this was metal we still borrowed it and had a look. Very well made with rolling bearings, the rollers stainless steel and the rest of the bearings plastic. The capacitance between the pulley and the body was hundreds of picofarads and with 25kV across the bearing as much as we can muster, gave an excellent imitation of an open circuit. Combined with the polypropylene rope, it formed a crude and surprisingly effective Van de Graaf generator. From the way the incident was describe it was most likely the individual affected discharged the rope and pulley through his head! at a conservative estimate there was half a joule of energy stored which is sufficient to upset the heart, and most likely the function of the brain too, it is not recommended any one tries this to find out. The pulley and block was easily modified to stop this reoccurring and the individual is still dust sampling and flying but not at the same time, as far as we know.

A phone call from a sampling team about a technical query brought out the fact that one of their number had hurt his foot, by dropping a weighty piece of our equipment, being painful but not serious this was treated by the team as a bit of a joke. I talked to the individual and discovered that he uses a hearing aid and whilst up a stack he was startled by a very loud noise, to the extent that he dropped what he was carrying. The barometric pressure was unusually high, a still day and glorious sunshine. However, the time, day, weather and location was the same as the first incident. The hearing aid had been checked by the manufacturers and the individual as-

sured me mobile 'phones didn't cause problems with it.

So what had happened? Our curiosity aroused, we started investigating on probable causes, the most likely culprit would be a high power RF source. There was no such equipment on the site and so our minds were cast further a field. Having exhausted usual RF radiators had a look at air navigation maps and went for a tour round. Some considerable distance away was a relatively new long range radar installation that tracked aircraft for hundreds of miles. These are pulsed radar working in the UHF spectrum with pulse repetition rates in the audio range. We then persuaded the individual with a sore foot to come down to the airfield and to see what happened, as soon as the radar was in use the hearing aid had to be switched off. Discussion with pilots showed that it also gave problems on their voice radio communications and, they had just learned to get used to it. At the time the incident occurred the weather was showing temperature inversion and under these conditions these frequencies can be refracted. During a subsequent similar weather pattern measurements up the stack showed field strengths of hundreds of volts a metre. The first incident was due to this source interfering with an insulin pump, who's manufacturers were very surprised to hear of the level of signal encountered and showed on their own tests that the pump was susceptible at the high field strengths and frequency. This shows how even diligent designers cannot foresee all scenarios.

The same piece of equipment kept being returned for repair, the same devices replaced each time. Discussing this with the customer who used it on just one site seemed to show that it occurred when it was being used on a new part of the installation, the users didn't seem to have any idea what was happening. A visit showed a new stack, when on the sampling gantry, to one side, was level with a 400kV power lines and down wind to the prevailing wind, so the overhead cables moved towards us during high winds. The sampling needed a 3.5 metre probe, at these voltages creepage and clearance takes on a whole different meaning. There was some difficulty in getting them to understand the risks until I got their safety officer to carry a fluorescent tube up the stack and when he was stood on the gantry with it glowing quite brightly, he turned a funny colour, they now sample from a different point.

Another 'phone call from the Health and Safety Executive explained that someone had received repeated electric shocks, luckily not serious from our equipment whilst sampling. Why companies don't contact us when they have problems of this sort defeats us. A visit where this had happened, showed a very modern and spotless installation, the only thing missing from the sampling point indoors where armchairs. Unfortunately, close inspection showed that the sampling was being done close to an electrostatic precipitator with high gas temperatures, which conduct electricity quite well. The shocks were coming from the precipitator, and until it was demonstrated with our equipment disconnected from its power supply it wasn't believed, interesting.

An interesting situation occurred to the author whilst sampling from an electric arc furnace at night. Our lamps on hard hats attracted insects, which is bad enough. The insects attracted the local bats who hung off our boiler suits as a convenient launch point for catching them. These charming, protected mammals have fine dentures and can carry hydro-encephalytus or rabies. The solution was to use ruby red lamps that didn't attract the insects. Is this an EMC problem? When radiating it is wise to do it at the correct frequency, or is this an obscure form of susceptibility?

My work as an expert witness is showing that companies and officialdom are increasingly going to litigation as the first choice. The forgoing situations plainly shows how with engineering the devil is always in the detail. However, we are looking at them, with all the wisdom of twenty-twenty hindsight. The key it could be argued is full and thorough risk assessment; is it reasonable to expect someone proposing to climb a stack to be on the lookout for radar systems over the horizon, or problems with bats at night? The lawyers dismiss the definition of "due diligence" as having to be determined by the courts, which makes me wonder whether this approach does really create a safer working environment. For when the sleet is coming at you horizontal the finer points of div, curl and grad are not upper most in peoples minds. For the lawyers; remember, arguing with engineers is like mud wrestling pigs: they enjoy it.

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Peter Williams is CEO of Tornado Technologies Ltd., and can be contacted by E-

Summary of Stack Monitoring Fatal-Accident Enquiry

This is a summary of the circumstances surrounding the fatal fall of an experienced stack-monitoring engineer, Matt DeVito, at a US coal mine preparation plant. This summary is based on accident investigation reports from the federal Mine Safety and Health Administration (MSHA) and the Virginia Department of Mines, Minerals & Energy published in January 2001.

Background

The monitoring team consisted of three people. Matt DeVito was team leader and had carried out work on this plant annually since 1985. Monitoring was to be carried out on the thermal drier, from a permanent platform with grating floor approximately 130 feet above ground level. The process operator gave the team a safety training session, including giving each team member a written list of hazards in the plant area. The site foreman also advised them verbally to be cautious of ice on the elevated walkways and to take a hammer to remove any ice they may encounter.

The circumstances of the accident

Matt DeVito ascended the stack to the work platform to begin hoisting equipment up, while the other two team members remained on the ground. Matt DeVito radioed down that there was ice on the platform and that they should move out of the way while he cleared it. The team members on the ground saw Matt DeVito kick the ice on the grating floor, after which a section of grating fell from the platform followed by the victim. Matt DeVito struck a section of the plant and then the ground and was found to be dead

at the scene of the accident.

The findings of the official investigations

The portion of grating that collapsed had suffered severe corrosion. Another section of grating was missing and had probably disintegrated before the accident. Gratings examined at other locations around the stack had suffered various degrees of deterioration. Some deterioration was very difficult to detect visually because the rusted material was of the same colour and thickness of the original metal.

The conclusion of the investigations was that the accident occurred because the grating on which the victim was standing was not maintained in good repair to prevent injuries to personnel. The operator was found to have violated a state law specifying that platforms, stairways and runways at mines must be kept clear of stumbling and slipping hazards and maintained in good repair. An enforcement order was put on the plant, shutting it until the investigation was complete and an action plan was agreed. A number of engineering and procedural remedial measures have been agreed between the operator and safety administration. These include a requirement for the plant foreman to formally inspect the areas at quarterly intervals, and additionally prior to anyone travelling or performing work in the areas.

Implications for STA members

This tragic accident illustrates a serious risk to members working at heights. It is especially worrying as permanent platforms are often considered to be inherently safer than temporary structures such as scaffolding. The circumstances of this incident suggest that a risk assessment carried out by the monitoring team involving visual assessment would have been unlikely to identify the hazard. Our members are, to a large extent, reliant on the process operator carrying out routine, thorough inspections to assess the structural integrity. The STA should consider the following:

- *How often should the operator inspect?*
  I would imagine this should be risk based, so that a very high platform in a corrosive atmosphere would require inspection much more frequently than a low platform in a non-aggressive atmosphere. However, there should be a minimum frequency of inspection and the platforms should always be inspected before our members use them.
- *Inspection standard*.
  Personally, I would not know if a platform at 130 feet needed to be secured with 10 bolts or 50. Is there any construction standard, in the UK or elsewhere, covering the design of elevated platforms and walkways against which the inspections can be benchmarked?
- *Evidence of inspection*.
  What is reasonable evidence that the inspection has been carried out and the assessment is that the platform is safe? My view is that the results of the inspection should be documented to have any serious standing.
- *Legislation.*
  Are there any UK regulations that specifically cover inspection of elevated platforms and walkways?

An ideal way forward would be for an industry code of practice to be agreed between monitoring organisations and industry, under the advice of the Health & Safety Executive. Environmental regulators could then set this as a specific condition in authorisations/ permits.

Jon Pullen,
STA H&S Task Group Chairman

20 June 2001

UK CASE LAW

Case law review of an employer installing a platform for a subcontractor, which subsequently failed during high winds leading to the death of the worker. The court found against the employer and fined them 50% of annual profits, because they had failed to instruct the sub-contractor's employees in its use and failed to ensure work would be suspended in severe wind conditions.

Reference: Health and Safety Briefing Issue 203, 21.11.00, p.3

Manual handling update

The Manual Handling Operations Regulations 1992 have now been in force for just over eight years. They have produced a mass of cases. The Regulations give rise to civil as well as criminal liability, so they have been extensively used by employees to claim compensation for workplace injuries incurred through manual handling operations. This article outlines the basic requirements of the Regulations, together with relevant control measures and current developments.

Regulations

The Manual Handling Operations Regulations 1992 apply to all employers in respect of their employees at work. Manual handling operations are defined as the transporting or supporting of any load, including the lifting, putting down, pushing, pulling, carrying or moving by hand or bodily force.

The main requirements of the Regulations are contained in Regulation 4. This requires employers, so far as reasonably practicable, to avoid the need for employees to undertake manual handling operations which involve a risk of injury. then this is not reasonably practicable, employers must make a suitable and sufficient assessment of all manual handling operations, taking into account certain factors. Regulation 4 also requires employers to reduce the risk of injury to the lowest level reasonably practicable and provide any training and information that may be necessary.

Employees have a duty to make full and proper use of any system of work laid down by the employer. This would include any training or safe systems of work developed by the employers to comply with their duties under these Regulations.

Avoiding manual handling

Although the Regulations only require a risk assessment to be carried out when it is not reasonably practicable to avoid the need for manual handling that may involve a risk of injury, in practice an assessment is needed to determine whether the activity will give rise to a such a risk. Once a risk of injury has been identified, the first step is to avoid the manual handling task altogether, where reasonably practicable. This will not only satisfy the requirements of Regulation 4, but will also fulfil the employer's duty of care under common law.

If the task cannot be eliminated, the most obvious way of avoiding manual handling is to mechanise the task. Since the introduction of the Regulations, a wide range of manual handling equipment has entered the market. These include trolleys, mobile elevating working platforms, access platforms, order pickers and rotating devices. Some trolleys are designed to work over uneven ground and up and down steps.

Risk assessment

If the manual handling task cannot be eliminated or avoided by mechanising the work and there is a risk of injury, risk assessment is necessary.

The guidance to the Regulations, which was updated in 1998, includes comprehensive advice on risk assessment. The most significant change in the 1998 version has been made to the so-called "recommended" maximum weights that can be lifted, relative to the position of the person and the load. The HSE emphasised that the figures given in the previous version of the guidance should be used as a guide and were not maximum weights. However, many people perceived the figures to be maximums. The figures given in the 1998 version are similar to those previously given, but they are called "risk assessment filters". The aim of calling them risk assessment filters is to indicate when a risk assessment should be triggered.

Unfortunately, employees are so different that on occasions some may fall through the filter. This illustrates the difficulty in making such assessments. They deal on the one hand with a load that is not always variable, while on the other hand with employees whose capability for manual handling is extremely variable.

Control measures

The risk assessment should identify the control measures needed. Apart from mechanising the task, reducing the load is probably the main control measure. This may be achieved, for example, by purchasing packages which weigh less, or perhaps specifying smaller building blocks for handling on a construction site. This latter measure is an interesting example of the overlap of the Regulations with other legislation, in this case the Construction (Design and Management) Regulations 1994, which lay down duties on designers to reduce risks associated with construction activities.

Attention to the ergonomic design of the workplace is another important factor in controlling the risks associated with manual handling. For example, the storage of material should be at a height that eliminates it being lifted from or to floor height.

Training in manual handling techniques is invaluable in controlling the risk. One such technique is known as kinetic lifting. Training is not an alternative to controlling the risk at source because it relies on employees always using their training properly. However, it can be useful in cases where many minor, everyday manual handling tasks are carried out or as an additional control measure.

Another control measure is the use of back supports. These should be approached with some caution. At best they may alleviate existing conditions, but at worst they encourage lifting beyond what normally could be lifted. They are certainly not a substitute for controlling the risk at source.

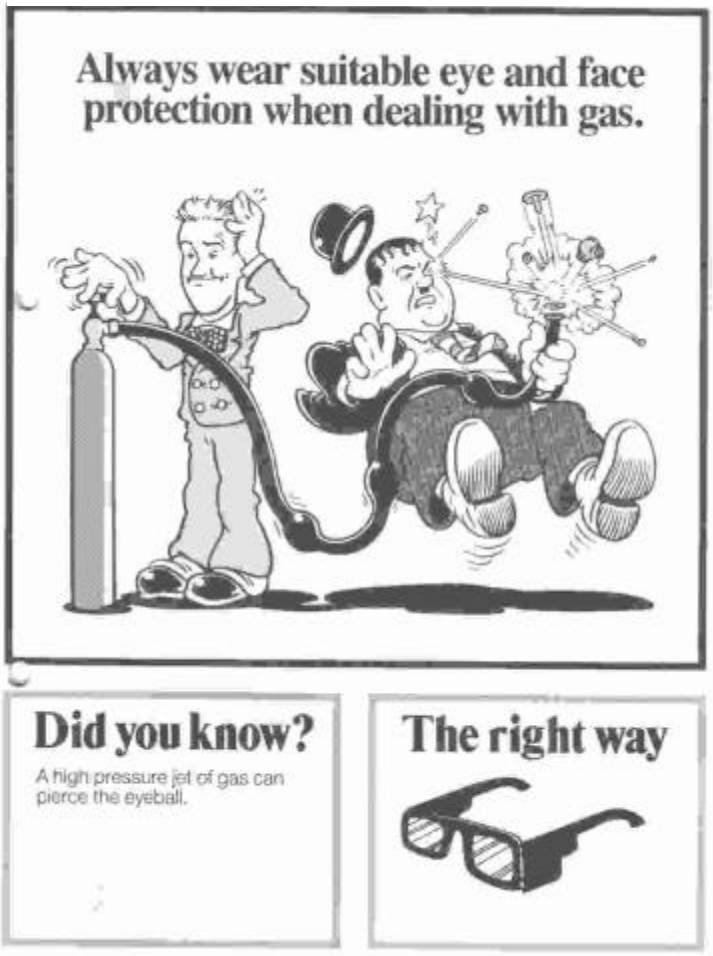
More controversially, a relevant control measure would be to employ a person who is capable of the manual handling task. There may be conflict here with an equal opportunities policy. The employer should carefully consider what measures may have to be introduced to implement such a policy to ensure that manual handling tasks do not cause harm.

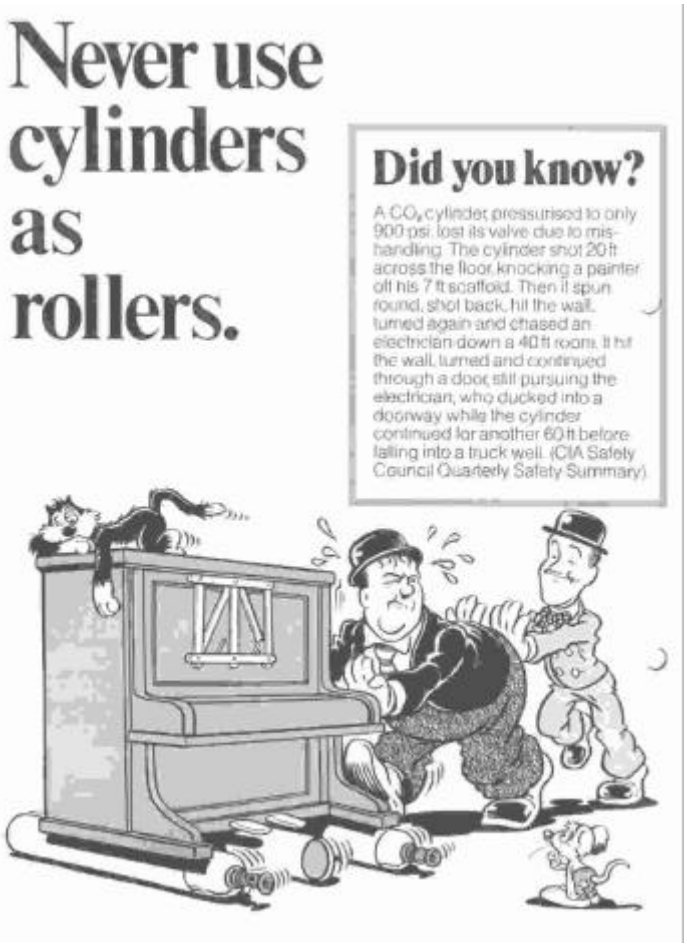
STA Health & Safety Guidance Notes

The complete list and download facility are available on the STA web site

or contact Samantha for paper copies

Below is the second in the serialisation of an old document originally supplied by Air Products.





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