

DANGER DUST

An analysis for the protection of workers
from the harmful effects of ballast dust
and the development of a five point
improvement plan

By John Pencott





INTRODUCTION

This pamphlet on the risks to workers exposed to dust hazards in the workplace has been prepared by one of our front line trade union accredited health and safety representatives Bro John Pencott. John has a background in the mining industry and has been in RMT membership for the last seven years.

John first rose to prominence in the union during a dispute over safety at the Amey Colas JV in 2012 which saw John leading RMT reps in securing safer working conditions. As part of the settlement, John was appointed as a lead union health and safety representative. He continued in this role when the High Output work was brought back under Network Rail's control.

John has recently completed his TUC stage III health and safety representative course. This publication is based on John's research project for the course. It is an excellent example of a front line worker assessing the health and safety risks to their members and designing solutions to those risks that will result in a better, safer working environment.

A handwritten signature in black ink that reads "Mick Cash". The signature is written in a cursive, flowing style.

Mick Cash, General Secretary

CONTENTS

Overview5

Glossary5

Introduction6

Background6

The Harm Caused by Silica Dust7

Silicosis7

What is the Problem?8

Five Point Improvement Plan13

Summery17

Conclusion18

References and Bibliography19

OVERVIEW

Currently the working conditions for some of Network Rail's employees working within the high output sector are some of the worst conditions seen in the rail industry, relating to dust. RMT would like to see vast improvements in the way dust related issues are tackled and has outlined a five-point plan discussed in this booklet.

The union is seeking both an immediate and a time-scaled approach to combat the hazards that have already caused ill health amongst the workforce and has potential to cause continued harm and potential loss of life to members.

GLOSSARY

BDWG	<i>Ballast Dust Working Group</i>
COPD	<i>Chronic Obstructive Pulmonary Disease</i>
COSHH	<i>Control of Substances Hazardous to Health 2002</i>
FFP (2-3)	<i>Filtering Face Piece</i>
GGC	<i>General Grades Committee</i>
HASAWA	<i>Health and Safety at Work Act 1974</i>
HOOB	<i>High Output Operational Base</i>
HSE	<i>Health and safety executive</i>
MDHS	<i>Methods for the Determination of Hazardous Substances</i>
MHASAW	<i>Management of Health and Safety at Work 1999</i>
ORR	<i>Office of Rail and Road</i>
PEL	<i>Permissible Exposure Limits</i>
PPE	<i>Personal Protective Equipment</i>
RMT	<i>Rail Maritime and transport Union</i>
WEL	<i>Workplace Exposure Limits</i>

Dropbox has been used to harbour additional evidence that has been collected. To access these documents follow the link below and login using the details provided.
<https://www.dropbox.com/login> Email: myessayevidence@gmail.com

Password: dropbox123

INTRODUCTION

This pamphlet aims to highlight what is needed and to illustrate the shortfalls of the controls currently in place to reduce the harm caused by working in a dust-ridden environment.

It aims to provide you with a greater understanding of the hazard of dust at work and how the union can make improvements in order to reduce or remove the problems associated with it. Firstly, there are a number of explanations of how and why we work in this hazard and how it has and will continue to have a potentially serious impact on the health of members if measures are not put in place to eradicate it.

BACKGROUND

The first part of the publication will seek to provide knowledge on how Network Rail's ballast cleaning and track renewal trains run and operate. We also aim to explain the need to renew ballast and track and why the dust produced from this process is such a hazard to the workers carrying out this procedure.

Network Rail first introduced High Output ballast cleaning machines in 2005, through the purchase of their first high output system. Before this date, ballast cleaning was carried out, but on a smaller scale with much smaller machines but using the same principal.

The High Output ballast cleaning trains are approximately a quarter of a mile in length. They consists of an RM900 which is the 'business' part of the machine. It is roughly 100 yards in length and comprises of two huge arms that are lowered to either side of the line on which the machine sits, into a hole that has been excavated prior to this. These two arms are connected, along with the scraper chain to make one continuous running excavator that removes ballast from under the track.

Following up and proceeding this machine are a series of supporting wagons, bringing in new ballast to replace the existing, when it is deemed to be worn out and conversely removing the obsolete ballast, along a series of conveyors that run through the centre of each support wagon, gradually emptying the new ballast wagons, and filling the spoil.

This is a continuous operation throughout the shift, with the machine itself calculating the track geometry making sure that the track, having been lifted, is placed back into the exact position according to the pre-defined specification. Ballast cleaning operations can last anything from two hours during the midweek to twelve hours at the weekend.

Network Rail has currently four of these machines in operation working almost every night, 365 days a year to ensure maximum safety. They also cost approximately £30 million each.

Several other machines form the high output fleet and these take up the old track and sleepers replacing them with new ones. To ensure that the track geometry is to specification, with a much smaller ballast cleaning undercutting machine follows up, putting the track back into a position within tolerance. All of the above operations are very finely tuned by tamping and regulating machines that ensure the track is within three millimetres of the specification this is very critical for trains passing each other do not collide.

The passage of thousands of trains over each section of track gives the ballast a grinding effect and each piece of ballast can be ground away to nothing more than dust, this is compounded by the elements and poor drainage accelerating the grinding process. This in turn creates voids in the track bed and makes our train journeys less comfortable and safe. Ballast cleaning operations must continue in order to maintain the track in a suitable condition.

THE HARM CAUSED BY SILICA DUST

So, how does silica dust hurt you? Silicosis is the oldest known industrial disease; it is believed that the Egyptians suffered from this. Bernardino Ramazzin, an Italian doctor first noticed in 1705 that the lungs of stonecutters and miners contained a substance that looked like sand. The name silicosis was first used by the prosecutor Achillie Visconti in 1870 and It comes from the Latin term 'Silex' which means 'Flint'.

SILICOSIS

(1) Silicosis causes harm by the prolonged breathing of crystalline silica dust. Fine particles deposited in the lungs cause thickening and scarring of the lung tissue. Crystalline silica exposure has also been linked to lung cancer.

A worker may develop any of the following three types of silicosis, depending on the concentrations of silica dust and the duration of exposure:

- Chronic silicosis - develops after 10 or more years of exposure to crystalline silica at relatively low concentrations.

- Accelerated silicosis - develops 5 to 10 years after initial exposure to crystalline silica at high concentrations.
- Acute silicosis - symptoms develop anywhere from a few weeks to 4-5 years after exposure to very high concentrations of crystalline silica.

Initially, workers with silicosis may have no symptoms. However, as the disease progresses a worker may experience:

- Shortness of breath
- Severe cough
- Weakness

These symptoms can worsen over time and lead to death.

Lung and Other Cancers

The HSE has accepted that silica exposure is responsible for several hundred lung cancer deaths a year in the UK. Silica related lung cancer is a government recognised industrial disease. International Agency for Research on Cancer noted crystalline silica in the form of quartz or cristobalite dust is carcinogenic to humans

Other Respiratory Diseases

The HSE, OSHA and other regulatory agencies accept silica exposure can cause COPD, reduced lung function with emphysema, or chronic bronchitis being diagnosed.

Renal disease

There is a direct link between silica exposure and kidney disease. OSHA suggests that there is evidence that silica exposure increases the risk of rheumatoid arthritis.

WHAT IS THE PROBLEM?

Starting from 2005 and continuing recently Network Rail have used contractors to operate the high output work. Private companies such as Babcock/Sweitlesky, AmeyColas, and Fastline Jarvis have all been used. These companies had a very high appetite for profit, and have paid very little attention to the control and protection of workers from dust. Each company had high profile slogans such as 'safety is our number one priority', and 'home safe at the end of the day', but in reality these were

slogans were very empty words. From the very first shift of the first machine, cleaning ballast dust has been a major issue. Please follow the links below, this will give you an indication of the problem.

<https://youtu.be/f7VgptOn5gM>

<https://youtu.be/raU0jEqfGTU>

<https://youtu.be/VbOuVc98Qdw>

In 2012, the HSE published new independent research led by Dr Lesley Ruston of Imperial College London, into the burden of occupational cancers in the UK caused by workplace exposure. Based on the research HSE estimates that almost 800 deaths a year are caused from occupational silica exposure.

(2) According to the ORR Latest report (Better Health is Happening) railway operatives may suffer higher levels of work-related respiratory diseases compared with the wider working population.

One of our members was employed in 2006 with a hereditary kidney disease, which was fully disclosed when he gained employment. He was placed into work with some of the dustiest conditions in the industry. Shockingly, by 2008 he was on dialysis, worse still, by 2010 he had suffered a heart attack and his kidneys had deteriorated so badly that he underwent a kidney transplant. His health has suffered terribly and to date no suitable or sufficient assessment of risk to his health and wellbeing has been carried out. RMT believe that his ill health is due to the fact he was allowed to work in such hazardous conditions, with little thought of his pre-disclosed condition, which contributed hugely to the accelerated kidney failure. The only unfortunate option left to him is to speak with the RMT solicitors about a potential claim.

Trade unions have, from a very early stage, recognised this hazard and RMT in particular which represents the majority of workers exposed to dust has challenged the rail industry as a whole to make improvements. This has been highlighted in every RMT hazard survey as the most concerning hazard to our members. We will take you through a number of requirements in legislation, as you will see the lack of both understanding of the hazard and the harm caused to our members when they are overlooked.

Risk Assessment or the assessment of the risk to health created by work involving substances hazardous to health, this is the basic underpinning requirement. If the employer doesn't understand the risk posed, how can he/she assess if the controls put in-place are both suitable and sufficient? Work must not start until this has been done. Please refer (*Control of*

Substances Hazardous to Health Regulations 2002, Regulation 6) (Assessment of the risk to Health created by work involving substances hazardous to health) (Management of Health and Safety at Work 1999 Regulation 3)(Risk Assessment).

Unfortunately written risk assessments are extremely scarce and it has become very difficult to find evidence of them. This illustrates that the controls were never implemented or they were neither suitable nor sufficient as required by legislation.

PPE is the only real development which has seen an improvement by upgrading slightly, going from the FFP2 Dust mask to the FFP3 type, both of which are tight fitting. However their use over long periods of time become less and less or totally in-effective. Some forced air respirators were issued around 2013 but this was limited. More recently over the last 3 months we have seen further improvements by upgrading more workers that Network Rail feel are at most risk from FFP3 to the forced air type respirators e.g. some machine operators not all of them, and some production workers.

Incredibly up to 2013 the wearing of PPE was not a mandatory requirement in High Output it was simply left to the individual to make an informed choice whether or not to wear a dust mask; this was if a dust mask was available and suitable at all it must be noted. Until very recently this mandatory requirement was never enforced on the worksite. Face fit testing was not started until 2012 the problem was that this was only done in part and many that were tested failed the original test only to be told "even if you fail the dust mask test wearing a dust mask at work has got to be better than not". See Dropbox document 'Face Fit Testing 2012'

Please Note (*Control of Substances Hazardous to Health Regulations 2002 Regulation 7*) prevention or control of exposure to substances hazardous to health. (1) Every employer shall ensure that the exposure of his employees to substances hazardous to health is either prevented or where this is not reasonably practicable, adequately controlled.

(9) Personal protective equipment provided by an employer in accordance with this regulation shall be suitable for the purpose and shall –

(a) Comply with any provision in the personal protective equipment Regulations 2002 which is applicable to that item of personal protective equipment.

It is a recommendation that PPE only be used as a temporary control measure until a permanent engineering control can be put in place.

(3) According to Hazards magazine two cases of stone masons, one of which was 67 years old (only two years into his retirement) and one 36

years of age, were both diagnosed with chronic silicosis and both wore a paper dust mask from being apprentices They are similar to workers on the high output because.

- They did not have a separate place to eat or drink; they simply had their breaks at the workplace so they were inadvertently consuming the dust.
- They had no changing or showering/wash facilities, they went home each day totally unaware of the hazards that came from the prolonged contact with dust.

Dust Monitoring is a fundamental requirement in the controlling and measuring of any hazard, especially dust. Systematic monitoring is a must to ensure that workers who are exposed have proper protection, unless an employer can demonstrate another method of evaluation. Hazards such as silica dust have workplace exposure limits that are set out as a permissible upper limit. (*Control of Substances Hazardous to Health Regulations 2002, Regulation 10*) Monitoring Exposure at the Workplace

Much research has been carried out in this field and the first instance of dust monitoring on the High Output, that was available to us, dates to 2007, carried out by Scientifics for Sweitelsky construction. The report makes pretty appalling reading, as it is conducted over one night, and the conditions quite clearly state rainy spells even saying that the ballast was damp. This appears to be a typical example of the sporadic dust monitoring carried out between 2005 to present day.

To compound this, RMT believe the testing method employed is both out of date and highly suspect. OSHA fully recognises this and have made recommendations in March 2014 for the reduction, by half, of the WEL or PEL. The testing that has been carried out on the high output, has been questioned on a number of occasion but to date I still have no satisfactory answers.

The test is an eight hours weighted test in line with the HSE, Health and Safety Laboratory MDHS, it is our belief that the figures have been incorrectly achieved as the 8 hour weighted was only actually a 30 minute exposure time on that night but the figures have spread across 8 hours diluting the actual dust levels for that 30 minutes.

Health Surveillance is an important part of the prevention of harm caused by substances hazardous to health, (*Control of Substances Hazardous to Health Regulations 2002, Regulation 11*) Health surveillance.

Regulation 11 clearly states that where appropriate for the protection of employees likely to be exposed to a substance hazardous to health then

employers must ensure employees are put under suitable health surveillance.

Similarly (*Management of Health and Safety at Work Regulations 1999 regulation 6*) Health surveillance

ACOP 41 References COSHH and puts a duty on employers for health surveillance and if we look at (a), (b), (c) and (d) where an identifiable disease such as Silicosis or health condition such as COPD can occur then health surveillance must be undertaken .

(*Health and Safety at Work Act 1974*) places a duty on every employer to ensure the health safety and wellbeing of all its employees section 2(1) general duties. Because our workplace is made up of directly employed workers and agency section 3(1) of the same act does apply.

From 2005 until around 2011-2012 no health surveillance was undertaken on any group of High Output workers by Network Rail, AmeyColas, or Babcock/Sweitelsky. Health surveillance was only started by AmeyColas in 2011 due to pressure applied by high output RMT representatives at the Safety Committee meetings. This was not the specific dust screening health surveillance that we had asked for; it was simply a general test including a lung function test of health and wellbeing. These tests were brought further into question when one of our members, who is in remission to lung cancer having had a lung removed passed the lung function test with results of 84%. It was decided by the member concerned and our representatives not to tell the nurse doing the lung function test beforehand and she was quite shocked when we informed her of our action and the member's disability. To date July 2015 there has been no further health surveillance programme.

Once that health surveillance was under way during 2011 RMT repeatedly asked for results to be provided to the health and safety reps, this was resisted at every point even after quoting (*Safety Representatives and Safety Committee Regulations 1977, Regulation 7*) Inspection of documents and the provision of information (1)(2)

We were told; the refusal came because it could compromise individual's private information meaning that AmeyColas would breach the Data Protection Act. We then requested a traffic light type report but again this was not provided. We will revisit health surveillance in my five point plan.

Dust Suppression should form the main part of engineering control measures adopted by the employer Network Rail in this case (*Control of Substances Hazardous to Health Regulations 2002, Regulation 7*) (*Prevention or control of exposure to substances hazardous to health*).

(Management of Health and Safety at Work Regulations 1999, Regulation 4)
(Principals of prevention to be applied) this area has seen a small amount of improvement, from 2005 until 2013. No engineering measures were taken to suppress dust on any of the High Output fleet, apart from the regulators that brush the track to a profiled level using a huge mechanical brush; this has dust suppression built into the machine from new. During 2013 AmeyColas developed a HOOB based water spray system that soaked the new stone before it departed from the HOOB onto the infrastructure and to the worksite. This proved to be less than successful as it was woefully inadequate. This was quickly upgraded with a bigger pump and a bigger spray bar system that released more water onto the new ballast as it left for the worksite. This also has limitations, as the worksite could be over 100 miles away from the HOOB several attempts have been made to speak to specialist companies over retro fitting dust suppression to the machines. These have failed, not because it couldn't be done, but because it was either highly inconvenient or too costly.

Education of every employee likely to work in a hazard such as dust: education must be one of every employer's top priorities. This unfortunately has been very limited and not as sufficient as legislation suggests. Employees have been told they must wear a dust mask or they must come to work clean shaven but very little else. The law requires sharing of information on a full range of information from the risk presented to workers, significant findings of risk assessment, exposure limits, and precautions to safeguard all employees in the workplace.
(Control of Substances Hazardous to Health Regulations 2002, Regulation 12)
(Information, instruction and training for persons who may be exposed to substances hazardous to health)

FIVE POINT PLAN FOR IMPROVEMENT

For a while Ballast Dust has been on the agenda of every health and safety committee meeting involving RMT at the High Output level. Collectively as a company council we have asked for improvements, but we have not developed that into a coherent plan for improvement.

RMT has been in a long consultation process with both reps and members in attempts to understand what we require and what legislation says we should have to bring protection levels up to the minimum standards required.

It is a common accusation aimed at health and safety reps that we come up with the problems or issues without trying to find the solutions. To answer this challenge we have created a five point improvement plan that will not

solve every issue but it will save lives and help prevent any further risk of ill health from this specific hazard. We have already spoken about the proposed plan with the Ballast Dust working Group, an industry wide group set up to look the harmful effects of working with ballast. I would like to point out that the union takes no responsibility for the actions of this working group and the trade unions are members in accordance with the Health and Safety at Work Act 1974 and the Safety Representatives and Safety Committee regulations 1977

1) *Dust Monitoring*

Dust monitoring is an underpinning requirement in calculating (WEL) it is a requirement under the (*COSHH Regulation 10*)

- What RMT would like to see is a more comprehensive study carried out over at least 3 months but preferably a 12-month sampling exercise.
- This study will capture every machine, every HOOB (High Output Operational Base), inside and outside the cabs, both production workers and machine operators. The principal of this being defined the worst case scenario of ballast dust and the associated silica levels.
- RMT would wish to see a full report of findings published at least every month. This report must contain monitoring figures, with recommendations for control measures, and risk reducing improvements in every report.

2) *Health Surveillance*

Where an employee is exposed to or liable to be exposed to a substance hazardous to health the employee must be put under health surveillance (*COSHH Regulation 11*)

We would like to see an annual dust health screening program started immediately which would include.

- At least a bi-annual chest X-ray for the most at risk workers with an annual lung function test. This step would bring testing into line with the coal and steel industry.
- A kidney function test.
- Easy access to an occupational health specialist that specialises in dust related ill health.

- An overall report to be published each year showing at least a traffic light system of at risk workers, categorisation of health effects and impacts qualified.
- We wish to view data from a historical health check carried out by AmeyColas from 2011-2013

3) *Education*

We wish to see a rail industry-led education programme to be developed that informs employees of:

- The harm that breathing in dust can cause,
- Explaining what silicosis is and how it can be prevented.
- Define the impact that long term exposure can have
- How employees can use and maintain RPE equipment supplied for use in protecting themselves
- How to spot early signs of Silicosis or breathing related ill health
- Management and Supervisory education on roles and responsibilities for the required Management requirements
- Education and briefing across the rail industry on the issues and impact of ballast dust
- What are Network Rail and the Unions are doing to protect them?
- What all staff are required to do to protect their selves?

This can be done collaboratively or if the employer refuses the RMT could create its own program of education, which can be approved by the General Grades Committee of the RMT.

Please see (*COSHH Regulation 12*)

4) *Welfare Provision*

As Network Rail employees working in dusty conditions (usually operators & production workers (*COSHH Regulation 7, 8, 9*), should have the following.

- An area that workers can have food and drinks not exposed to ballast dust whilst taking their allocated meal breaks.
- Changing facilities for all at the start and end of each shift.
- Shower facilities for everyone to allow any dust to be washed

off before leaving for home, minimising prolonged exposure to dust related health complications

- Disposable Hi-Visibility clothing so this could be removed, before removing RPE.
- Ability to operate a clean and dirty segregation of clothing.
- Ensure that communication equipment is fully compatible with the supplied RPE. This so that all PPE can be worn and Communications be safely and adequately used without compromising the integrity and function of the RPE. Without the need to remove or simply wear inappropriate PPE because Communications cannot be maintained.

5) *Dust Suppression.*

To date July 2015 Apart from the High Output regulators our machines have no form of dust suppression fitted to them. Dust suppression is an engineering control measure and should be the secondary level in the hierarchy of control to elimination. Dust masks and PPE should only be used as a temporary control measure until safety can be engineered into our machines; disappointingly the issue has been highlighted over ten years with no positive changes made. Disappointingly the only line of protection remains a dust mask, surely with today's technology more advanced measures can be taken in the near future?

Please see (*COSHH Regulation 7, 8, 9*).

We accept that BCS 5 will have dust units fitted to it at the design and build stage.

The monsoon systems working from each HOOB are according to members having little or no effect on reducing the dusty conditions. We wish to see improvements made to this by.

Monsoon simulators only dampen down the new ballast. They have no positive effect on the in-ground ballast and associated contaminants and associated dust developed through the cleaning process.

- Retrofitting of suppression units to each D75 machine as the monsoon system however effective/in effective has no impact on dust suppression for this machine.
- Retrofit dust suppression to all Ballast Cleaners that currently do not have any.
- Retrofit Dust suppression to Auto Hoppers, sea cows Diggers etc.

- Review the previously supplied quotes made by Mist Air for Carrying out this work

Further Regulation

This publication only quotes from one regulation but several other regulations to support our overview are relevant. The prominent one being the Health and Safety at Work Act 1974 section 2(1) General Duties.

Associated regulations to consider are:

- The Management of Health and Safety at Work Regulations 1999
- Welfare Regulations 1992
- PPE Regulations 1992
- Safety Reps and Safety Committee Regulations 1977

SUMMARY

To summarise, the high output has been in operation for around ten years. It is made up of six machines for ballast cleaning systems that remove and replace old worn out ballast and two re-railing machines that replace track and sleepers, included with them are two under-cutter machines that put the track back into the correct specified position. This process produces an unacceptable amount of silica dust.

Silica related ill health is the oldest industrial disease known to man; it causes silicosis, which once contracted is an incurable lung disease. This can lead to lung cancer, COPD, emphysema, or chronic bronchitis there is also a high risk of renal failure or rheumatoid arthritis.

Well documented evidence of this is more than readily available of this hazard and its potential devastating and life threatening results.

We have developed a five point improvement plan based around the current requirements in the Control of Substances Hazardous to Health Regulations 2002. RMT believes that Network Rail are in a position to go much further by putting in-place timescales for improvements and aiming to improve by much further than minimum standards.

CONCLUSION

RMT has used several sources to gather credible evidence to support the points we have made throughout this project including reviewing literature & speaking to reps and members. We have also sought advice from senior trade union officials; which has brought much clarity and certainty on the controls needed when working in a dusty environment, and the appropriate steps that must be taken in order to reduce/eliminate these risks. The main components of the proceeding essay are as follows:

- What Network Rail and High Output, as a sector of Network Rail, do to create such a hazardous working environment.
- Why, historically speaking, very little has been done in the form of protection and control.
- Why and how silica dust can have serious impacts on worker's health, including fatal consequences as a result of the neglect shown.

We have reviewed, section by section, each area where Network Rail have a duty placed upon them under regulations such as COSHH, MHSAW, PPE regulations and the HASAWA.

Organisations such as OSHA, Hazard Magazine and the ORR all make arguments to support my research, OSHA in particular are currently campaigning for a reduction of WEL/PEL to that of half UK limits, further validating the standpoint we are presenting.

The proposed five-point plan has had collective support from the RMT, with members and representatives having stated they believe this proposal will save lives. Additionally it has been released for submission to the GGC for approval as the basis of a policy document.

RMT representatives have attended the newly reformed BDWG meeting with cross rail industry representation to push for further support on this five-point plan. Some of the plan has already started to take effect as a joint employer trade union meeting has taken place with a dust monitoring company to put forward our demands, and is showing significant gains.

This is not the end of this project, in some respects and for our members it is just the start, RMT firmly believes that our place of work should be made safe so that our members can go to work without fear of ill health.

The cost of implementing our five point plan is of miniscule amount compared to the suffering and wretchedness our members and their families will have to endure if Network Rail doesn't take this opportunity to

make the changes we are demanding. Some significant steps have been already taken. But we cannot rest as a trade union until each and every point is either firmly in place or an agreed timescale for improvement that both the union and Network rail can sign up to.

While this pamphlet concentrates on the High Output production processes at Network Rail the environment of dust is not solely confined to that area of our membership. Other groups such as engineering grades, shipping grades and track workers on London Underground may be exposed in to these hazards and risks. The five point plan is readily adaptable to other groups of workers. Should you require additional assistance please contact the Health and Safety section at Head Office.

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Workplace Health, Safety and Welfare Regulations 1992 *Crown Copyright 1992*

www.osha.gov

www.hse.gov.uk

www.cdc.gov/niosh

www.iarc.fr

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