

CORPORATE PROCEDURE FOR  
**AIRBORNE DUST MANAGEMENT**  
**CS-OHS-1**

Responsible Officer: Health & Safety Coordinator

Approved: GM Production

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## 1. Purpose

- 1.1 To provide a procedure for the management and control of dust within CS Energy.
- 1.2 To ensure that no person on, or in the vicinity of, a CS Energy site is exposed to dust resulting from CS Energy operations, at a level exceeding those outlined in the Worksafe Australia document, Exposure standards for Atmospheric Contaminants in the Occupational Environment.
- 1.3 To ensure compliance with the relevant requirements of the Workplace Health & Safety Regulations and Advisory Standards in regard to hazardous dusts.

## 2. Scope

- 2.1 This procedure applies to CS Energy sites where hazardous and nuisance dusts are present.
- 2.2 This procedure does not apply to asbestos or synthetic mineral fibre dusts which are addressed in Corporate Procedure CS-OHS-3, Hazardous Airborne Fibre Management.

## **3. Actions**

### **3.1 Excessive Dust**

- 3.1.1 Where it is reasonably suspected that excessive dust may be present in a work environment (see attachment 6.1 Section 6.1.2 Indicative Signs), a risk assessment should be carried out.
- 3.1.2 Where it is determined that there may be a significant risk of exposure to people, then appropriate actions must be taken to determine the extent of the risk ie. monitoring.
- 3.1.3 Where monitoring indicates the likelihood of exposure above the Worksafe Australia national exposure standard, then steps must be taken to ensure the potentially exposed people are adequately protected by utilising appropriate controls. This may include but is not limited to those controls outlined in Attachment 6.1, Section 6.1.3 Controls.

### **3.2 Combustible Dusts**

- 3.2.1 The relative hazard posed by a combustible dust depends on its ease of ignition and the severity of the resulting explosion.
- 3.2.2 The quantity of dust needed to produce an explosive atmosphere is orders of magnitude larger than those allowed by Worksafe Australia for occupational exposure (ie. coal – 550,000 mg/m<sup>3</sup>: WES-TWA 3 mg/m<sup>3</sup> as respirable dust).
- 3.2.3 Coal dust (particularly pulverised fuel) should not be allowed to accumulate in large quantities on I-beams, ledges and other surfaces. Good housekeeping is essential.
- 3.2.4 Confined spaces should be cleaned such that high levels of dust cannot become airborne and pose a potential hazard.
- 3.2.5 Potential ignition sources must be identified and, where possible, eliminated.

### **3.3 Siliceous Dusts**

- 3.3.1 Special attention should be given to dusts containing respirable free silica, (dust capable of entering deep into the lungs) which is in the quartz, cristobalite or tridymite phases in excess of 1%.
- 3.3.2 All employees who work with dust containing greater than 1% silica need to be informed of its potential effect upon their health.

### **3.4 Guidelines for the Health Surveillance for Crystalline Silica**

- 3.4.1 Where a risk assessment and subsequent monitoring have indicated that there is a significant risk of exposure to levels of crystalline silica above the Worksafe Australia national exposure standard then health surveillance shall be undertaken as per Schedule 6 of the Workplace Health & Safety Regulation 1997.

3.4.2 This surveillance shall include but is not limited to:

- Chest X-Ray, full size Pa view
- Demographic, medical and occupational history
- Exposure record
- Health advice
- Standard respiratory function test including, for example FEV<sub>1</sub>, FVC and FEV<sub>1</sub>/FVC
- Standard respiratory questionnaire to be completed.

### **3.5 New Plant**

3.5.1 When preparing specifications for the installation of new plant the following factors should be considered:

- The uncontrolled discharge of airborne dust from plant into the work environment be prevented unless conditions make this impractical.
- Discharge of dust into working areas shall be prevented by the utilisation of dust suppression systems or dust extraction systems.
- Maintenance schedules include the inspection and repair of all seals from which fugitive dust may escape.

### **3.6 Personal Protective Equipment**

3.6.1 For jobs where excessive dust levels may be generated, an approved disposable particulate respirator or half face respirator fitted with particulate cartridges should be worn. Employees who are not clean shaven should use a full face ventilated or positive pressure respirator.

3.6.2 Employees should be trained in the correct use of respiratory protection.

3.6.3 Respirators shall be correctly fitted, maintained in good condition and kept in clean storage when not in use.

3.6.4 Replaceable filters, cartridges and disposable respirators should be replaced regularly, in accordance with guidelines issued by the manufacturer.

3.6.5 All respirators shall comply with the provisions of Australian Standards AS1715 and AS 1716.

3.6.6 Safety goggles or face shields can be worn to avoid eye irritation or injury, especially when performing overhead work.

3.6.7 Skin irritation can be minimised by the use of gloves and loose fitting long garments.

3.6.8 Disposable coveralls as issued may be worn if excessively high dust release is expected during the work. These disposable garments should be disposed of in the plastic bags with the other wastes associated with the job.

## 3.7 Education and Training

3.7.1 People who work with significant levels of dust should be provided with adequate information, instruction and training on:

- Any health information relating to the excessive exposure to different types of dust and in particular that containing free silica at levels greater than 1%.
- The importance of controlling the creation of dust in the atmosphere to the lowest workable levels.
- The probable exposure levels associated with the type of job.
- How safe work practices, such as control measures, respiratory protective equipment and protective clothing can be used effectively.
- The role and significance of air monitoring.
- Employer and employee responsibilities.

A training package has been developed and is available at:

- K:\Corprocs\O-h-s\Training\Airborne Dust.

## 3.8 Responsibilities

3.8.1 The Workgroup Co-ordinator shall ensure where work is to be carried out in a dusty environment that:

- Appropriate procedures are complied with.
- All attempts are made to reduce the exposure of personnel to excessive dust via the appropriate controls.
- Where the potential of exposure to dust containing greater than 1% free silica is possible that the personnel are informed of the associated risk and attend an information session in relation to the hazards.
- If particulate respirators are utilised as part of the control regime that the personnel are instructed as to their correct selection, use and maintenance.

3.8.2 Workers are responsible for:

- Ensuring that any personal protective equipment issued is used and maintained according to instructions.
- Work carried out in a potentially dusty environment is done so according to appropriate procedures aimed at minimising the generation of airborne dust.

## 4. Definitions

4.1 “Combustible Dust” - a dust that is combustible or ignitable in mixtures of air. Examples of such dusts include coal dust, charcoal, grain dust, starch and some metal dusts such as aluminium and magnesium.

4.2 “FEV<sub>1</sub>” - Forced expiratory volume in 1 second. Lung function test in which the volume exhaled in the first second is measured.

- 4.3 "FVC" - forced ventilatory (vital) capacity. Lung function test in which the subject is required to exhale as hard and as fast as possible.
- 4.4 "Exposure Standard" - means an airborne concentration of a particular substance in the worker's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers.
- 4.5 "Nuisance Dust" - Also referred to as "Dusts Not Otherwise Classified" are dusts which do not contain toxic impurities and are of low toxicity, ie. dusts containing less than 1% crystalline silica.
- 4.6 "Power Tools or Equipment" – equipment powered by artificial means such as electric motors, petrol engines and compressed air.
- 4.7 Respirable dust – particles that are able to penetrate into the alveolar region of the lung ie. crystalline silica, asbestos.
- 4.8 "Silica" - is silicon dioxide, which usually occurs as quartz, a crystalline silica. It is the main component of sand, sandstone, granite and other rocks. It may also be found in varying quantities in coal and coal ash from less than 1% to greater than 20 %, depending on the source of the coal.
- 4.9 "Siliceous Dusts" - Are dusts which are known to contain crystalline silica.
- 4.10 "Cristobalite" - A crystalline phase of silica stable at very high temperatures ie. between 1470°C and 1730°C. Pure quartz when heated to between 867°C and 1470°C is nearly always converted to cristobalite.
- 4.11 "Tridymite" - A crystalline phase of silica stable between 867°C and 1470°C.
- 4.12 WES–TWA: Workplace exposure standard - time weighted average – the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

## 5. Reference Documentation

- 5.1 AS 1715 - 1994 Selection, Use and Maintenance of Respiratory Protective Devices.
- 5.2 AS 1716 - 1994 Respiratory Protective Devices.
- 5.3 AS 2430.2-1986 Classification of Hazardous Areas. Part 2: Combustible Dusts.
- 5.4 Cameron, I. R., Bateman, N. T., "*Respiratory Disorders*" Edward Arnold Ltd, 1983.
- 5.5 Parkes., W. R., "*Occupational Lung Disorders*" 2<sup>nd</sup> Edition. Butterworth & Co. London. 1982.
- 5.6 Queensland Workplace Health and Safety Act & Regulations.
- 5.7 Rekus, J.F., Complete Confined Spaces Handbook. Lewis Publishers. 1994.
- 5.8 Workplace Health and Safety Advisory Standard for Hazardous Substances 1999.

- 5.9 Worksafe Australia, Exposure Standards for Atmospheric Contaminants in the Occupational Environment. Guidance Note [NOHSC:3008(1995)], National Exposure standards, [NOHSC:1003(1995)]. May 1995.
- 5.10 K:\Corprocs\O-h-s\Training\Airborne Dust.

## **6. Attachments**

### **6.1 Additional Information**

#### **6.1.1 Risks**

Health risks associated with dusty areas include but are not limited to:

- Irritation of the eyes, nose and throat
- Dermatitis or inflammation of the skin
- Sensitisation
- Aggravation of pre existing lung conditions
- In severe cases, permanent damage to lung function

Physical risks also associated with excessive dust include:

- Obscuring of signs and instruments
- Abrasive damage to equipment
- Reducing light emission from light fittings
- In extreme cases, explosions from the ignition of organic dusts ie. coal

#### **6.1.2 Evaluation**

It is important to be aware of the different dust characteristics as their effects can vary dramatically. Dust types and characteristics vary from site to site particularly in the areas of coal feedstock. In general the main classes of dust likely to be encountered include:

- Coal dust and ash (containing more than 1 % quartz)
- Nuisance Dust, such as coal dust and ash (containing less than 1% quartz) and some abrasive blasting dusts such as ilmenite and garnet
- Wood dusts
- Toxic Dusts, ie. hexavalent chrome, vanadium pentoxide

Indicative signs of a potential dusty area include:

- Dust haze in a particular area that does not disperse
- An increase in respiratory complaints
- Increase in nasal or eye complaints

### 6.1.3 Controls

The primary aim should be to limit dust exposure via the control of excessive dust emissions rather than the utilisation of personal protective equipment (PPE). This should be used as a secondary measure.

Where excessive dust emissions from plant occur, it should be assessed to determine the practicality of modifying the plant to eliminate the cause of the problem. Where this is impractical or cannot be undertaken in the near future, then secondary controls should be put in place to ensure exposure is kept below the prescribed exposure limit.

Priority should be given to controls that will remove dust at the source.

Determine whether any dust is deposited on surfaces. Dust may not be obvious and may be dislodged from structure or equipment by vibration.

Good housekeeping practices should be maintained in work areas. Dust and solid debris should not be allowed to accumulate and should be cleaned regularly.

Remove as much of the dust as possible by either vacuuming or spraying with water. Do not use compressed air to blow the dust away.

Where there is a potential for explosion, no naked flame or welding is to be permitted until the area has been cleaned of excessive dust.

Where situations arise such that dust levels cannot be reduced significantly below the prescribed levels then appropriate personal protective equipment should be utilised by all personnel entering the area.

Where power tools or equipment are used for the cutting of products containing crystalline silica, extraction at the source of the surface should be employed.

## 7. Document History

Issue Date	Nature of Changes
23/11/99	Original Issue