



CS ENERGY PROCEDURE FOR AIRBORNE DUST MANAGEMENT CS-OHS-01

Responsible Officer: Health and Safety Advisor
Responsible Executive: Group Manager Health Safety Security Environment

DOCUMENT HISTORY

Key Changes	Prepared By	Checked By	Approved By	Date
Original Issue				23/11/1999
Format changes, new template, section 4.3.1 addition	C Kendrick-Ward	D Peter-Hughes	K Ussher	07/05/2013



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1 PURPOSE

To provide a procedure for the management and control of dust within CS Energy.

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.

To ensure compliance with the relevant requirements of the Workplace Health & Safety Regulations and Advisory Standards in regard to hazardous dusts.

2 SCOPE

This procedure applies to CS Energy sites where hazardous and nuisance dusts are present.

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 RESPONSIBILITIES AND ACCOUNTABILITIES

3.1 Management

Management are responsible for ensuring that:

- Ensure that appropriate training and supervision is provided to enable workers to safely perform work associated with Airborne Dust.
- Action is taken to apply control strategies on a continuing basis to reduce exposure to Airborne Dust to the lowest workable levels.
- Ensure procurement, operating and maintenance procedures adopted for the use of work in or around Airborne Dust at the workplace are appropriately managed.
- That the duties and authorities for the management of Hazardous Dust areas are allocated to competent personnel within the organisation.
- Ensure sufficient resources and budget control strategies are implemented for exposure monitoring, health assessments and the provision of personal protective equipment.
- Provide and maintain safe plant and structures for working with materials containing silica.
- Providing information, instruction, training and supervision.
- Ensuring the workplace conditions are monitored to prevent illness from carrying out work with silica.

3.2 Employees / Contractors / Consultants

Employees, Contractor and Consultants are responsible for ensuring 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.
- 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.
- If particulate respirators are utilised as part of the control regime that the personnel are instructed as to their correct selection, use and maintenance.

4 ACTIONS

4.1 Excessive Dust

- Where it is reasonably suspected that excessive dust may be present in a work environment (see Section 4.4.2 Evaluation, Indicative signs), a risk assessment should be carried out.
- 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 i.e. monitoring.
- 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 Section 4.4.3 Controls.

4.2 Combustible Dusts

- The relative hazard posed by a combustible dust depends on its ease of ignition and the severity of the resulting explosion.
- The quantity of dust needed to produce an explosive atmosphere is orders of magnitude larger than those allowed by Worksafe Australia for occupational exposure (i.e. coal – 550,000 mg/m³: WES-TWA 3 mg/m³ as respirable dust).
- 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.
- Confined spaces should be cleaned such that high levels of dust cannot become airborne and pose a potential hazard.
- Potential ignition sources must be identified and, where possible, eliminated.

4.3 Siliceous Dusts

- 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%.
- All employees who work with dust containing greater than 1% silica need to be informed of its potential effect upon their health.

4.3.1 Exposure standard for respirable crystalline silica (RCS)

The Exposure standard represents the airborne concentration of a particular substance or mixture that must not be exceeded.

The WHS Regulation establishes a minimum standard for exposure to dusts containing RCS where the exposure cannot be prevented. In this case, the relevant exposure standard for dusts containing quartz, cristobalite or tridymite which cause chronic disease is the 8 hour Time Weighted Average Exposure Standard (TWA-ES) of 0.1 mg/m³ measured as RCS in the respirable dust portion of a dust cloud.

Guidance for making this adjustment for extended shifts is provided in the Safe Work Australia Guidance on the interpretation of workplace exposure standards for airborne contaminants using an appropriate model (e.g. using the conventional Brief and Scala shift adjustment model, for a 10 hour work shift, the TWA-ES for RCS is reduced to 0.07mg/m³, and for a 12 hour work shift, it is reduced to 0.05 mg/m³*).

* mg/m³ = milligrams per cubic metre of air



Note:

It should be noted that the TWA-ES of 0.1 mg/m³ applies to a standard 8 hour working day. If your work shift is longer than 8 hours, it is necessary to make some downward adjustment in the exposure standard. This is to allow for both the extended period of work exposure and the diminished amount of time for recovery and clearance mechanisms to operate between consecutive shift exposures.

4.4 Risk assessing and Evaluations

4.4.1 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



4.4.2 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

4.4.3 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.



4.5 Guidelines for the Health Surveillance for Crystalline Silica

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 the Work Health & Safety Regulation 2011.

- 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 FEV₁, FVC and FEV₁/FVC
 - Standard respiratory questionnaire to be completed.

4.6 New Plant

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.

4.7 Personal Protective Equipment

- 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.
- Employees should be trained in the correct use of respiratory protection.
- Respirators shall be correctly fitted, maintained in good condition and kept in clean storage when not in use.
- Replaceable filters, cartridges and disposable respirators should be replaced regularly, in accordance with guidelines issued by the manufacturer.
- All respirators shall comply with the provisions of Australian Standards AS1715 and AS 1716.
- Safety goggles or face shields can be worn to avoid eye irritation or injury, especially when performing overhead work.
- Skin irritation can be minimised by the use of gloves and loose fitting long garments.
- 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.



4.8 Education and Training

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 in TRIM - ["TR/13/17"](#)

5 DEFINITIONS

Term	Definition
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
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.
Exposure Standard	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.
FEV	Forced expiratory volume in 1 second. Lung function test in which the volume exhaled in the first second is measured.
FVC	Forced ventilatory (vital) capacity. Lung function test in which the subject is required to exhale as hard and as fast as possible.
Nuisance Dust	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.
Power Tools or Equipment	Equipment powered by artificial means such as electric motors, petrol engines and compressed air.
Respirable dust	Particles that are able to penetrate into the alveolar region of the lung ie. crystalline silica, asbestos.
Silica	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.
Siliceous Dusts	Dusts which are known to contain crystalline silica.
Tridymite	A crystalline phase of silica stable between 867°C and 1470°C.
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.

6 REFERENCES

Reference No	Reference Title	Author
	Work Health and Safety Act 2011	Qld Govt
	Work Health and Safety Regulation 2011 (particularly Chapter 3 – General risk and workplace management and 7.1 – Hazardous Chemicals)	Qld Govt
AS/NZS 1715:2009	Selection, Use and Maintenance of Respiratory Protective Equipment	Standards Aust
AS/NZS 1716-2003	Respiratory Protective Devices	Standards Aust
AS/NZS 60079.10.2:2011	Explosive Atmospheres – Classification of areas – Combustible dust atmospheres Part 2 – Combustible Dusts	Standards Aust
AS 2985:2009	Workplace Atmospheres - Method for sampling and gravimetric determination of respirable dust	Standards Aust
	Respiratory Disorders Edward Arnold Ltd,1983	Cameron, I. R Bateman, N. T
	Occupational Lung Disorders 2 nd Edition. Butterworth & Co. London 1982.	Parkes., W. R
	Managing Risks of Hazardous Chemicals in the Workplace Code of Practice 2012	Safe Work Aust.
	How to Manage Work Health and Safety Risks Code of Practice 2007	Safe Work Aust.
	Hazardous Substances Information System	Safe Work Aust.
	Workplace Exposure Standards for Airborne Contaminants 2011	Safe Work Aust.
	Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice 2012	Safe Work Aust.
	Guidance on the interpretation of workplace exposure standards for airborne contaminants 2012	Safe Work Aust.
	Labelling of Workplace Hazardous Chemicals Code of Practice 2011	Safe Work Aust.
	Commonwealth of Australia Gazette No C6, 4th June 1996 – Adjustment of 8 hour Time Weighted Average Exposure Standards for altered work shifts	
"TR/13/17"	TRAINING - Health and Safety Training - Airborne Dust	CS Energy