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KOGAN CREEK POWER STATION PROCEDURE

MANAGEMENT OF RESPIRABLE DUST
KA-OHS-24

Responsible Officer: Kogan Business Partner Health and Safety
Responsible Manager: General Manager Kogan Power Station
Responsible Executive: Executive General Manager Plant Operations

DOCUMENT HISTORY

Key Changes	Prepared By	Checked By	Approved By	Date
Original Release - Develop Dust Control Plan to ensure compliance with Code of Practice	N Seibel L Wolski	D Clarke	P Matha	31/07/2019
Correction to TRIM link for dust register	S Collard	B Day	N/A	19/08/2019

CONTENTS

1 PURPOSE

This procedure specifies the requirements for managing identified dust risks at Kogan Creek Power Station, in compliance with Work Health and Safety (Qld) legislation and the Draft Code of Practice Management of respirable dust hazards in coal-fired power stations (2018).

2 SCOPE

This procedure applies to all Kogan Creek Power Station workers.

3 RESPONSIBILITIES AND ACCOUNTABILITIES

3.1 General Manager Site

The General Manager is responsible for ensuring that:

- The dust monitoring program is administered on site.
- They implement the Kogan Creek Power Station Annual Improvement Plan – Respirable Dust Management 2018/2019
- They budget and provide resources to manage dust control measures

3.2 Head of Health and Safety

Head of Health and Safety is responsible for ensuring that:

- They liaise with the site General Managers regarding the health monitoring program
- They provide the annual health monitoring schedule to the Kogan Creek Power Station Health and Safety Business Partner
- They provide health statistics and reporting for health and safety committees

3.3 Health and Safety Business Partner (BP)

Health and Safety Business Partners are responsible for ensuring that they:

- Assist with the identification of mechanisms for dust generation and specific tasks for generation of dust on site
- Liaise with the Site General Manager regarding dust monitoring results (in particular, exceedances)
- Review and report on health monitoring results
- Assist with an incident investigation into dust exposure exceedances.
- Maintain and calibrate site dust monitoring equipment.
- Assist with administering the dust monitoring program on site.
- Provide health statistics and reporting for health and safety committees
- Review the reports of dust monitoring at Kogan Creek Power Station
- Provide advice on dust reports in relation to health surveillance
- Assist and manage pre- employment medicals, spirometry, lung capacity checks
- Liaise with the Chief Medical Officer about individual's health.

- Organise fit testing for respirators for identified workers

3.4 Certified Industrial Hygienist

Industrial Hygienists are responsible for ensuring that they:

- Undergo monitoring of dust risks at Kogan Creek Power Station at an agreed schedule.
- Report findings of dust monitoring results to CS Energy
- Provide recommendations on findings from site visits
- Provide a database to CS Energy to collate all dust monitoring results

3.5 Chief Medical Officer (CMO)

The Chief Medical Officer is responsible for ensuring that they:

- Review the hygiene monitoring program on at least an annual basis and provide health surveillance advice to CS Energy
- Have a qualified occupational physician undergo valid techniques to detect the effect on workers from exposure to dust
- Perform pre-employment medicals, provide records of medicals to CS Energy, provide individual records to monitored workers.

4 IDENTIFICATION OF DUST

Dusts can be generated in a number of ways at Kogan Creek Power Station including;

- Coal dust and ash (containing variable percentages of respirable crystalline silica)
- Abrasive blasting dusts such as ilmenite and garnet – refer to CS Energy HS Handbook
- Synthetic man-made mineral fibres (e.g. glass wool, rock wool and ceramic fibres) – refer to CS Energy HS Handbook

Workers at Kogan Creek Power Station engage in a range of work tasks or processes which may involve handling or exposure to respirable dust, including coal dust or coal fly ash. The combustion process, in addition to producing steam for power generation, also produces coal fly ash and bottom ash, collectively known as “coal ash”, as a waste product. There are potential health effects from the exposure of dusts, including;

- Pneumoconiosis (e.g. coal workers' pneumoconiosis or ‘black lung’) and chronic obstructive pulmonary disease (COPD) such as bronchitis and emphysema
- Lung scarring and fibrosis (e.g. silicosis)
- Systemic toxic effects caused by absorption into the blood
- Allergic and hypersensitivity reactions
- Cancer
- Irritation of the mucous membranes of the nose and throat

A Qualitative Hygiene Risk Assessment (HRA) has been completed at Kogan Creek Power Station to identify high risk areas at the power station.

4.1 Mechanisms for generation of dust

Dust is generated by different mechanisms on site and has been categorised by specific plant and functional locations relevant to a particular SEG – K/D/19/2032 refer to Kogan Creek Power Station Mechanism of Dust Register – Task and Plant. Annual Improvement Plans are developed based on risk i.e. high dust risks are prioritised and the hierarchy of controls is considered to eliminate or engineer the risks – refer to the Kogan Creek Power Station Annual Improvement Plan – Respirable Dust Management. The Improvement Plan is developed annually in line with the budget planning cycle, in consultation with relevant engineers, planners, health, safety and environment personnel, operational and maintenance personnel, approved by the site General Manager.

4.2 Specific tasks for generation of dust

Tasks generating dust have been identified and categorised by specific plant and functional locations relevant to a particular SEG – K/D/19/2032 refer to Kogan Creek Power Station Mechanism of Dust Register – Task and Plant.

4.3 Shift arrangements

Exposure standards have been set for dust and are adjusted accordingly for changes in hours worked in each shift. The Time Weighted Average (8 hr) used at CS Energy for respirable dust is 2.5mg/m3 and silica is 0.01 mg/m3. At Kogan Creek Power Station the following table outlines the adjusted exposure standards for respirable dust and silica for the different shift arrangements.

Shift (hrs)	Respirable Dust (mg/m3)	Silica (mg/m3)
7.6 (5 on/2 off)	2.5	0.1
9.5 (4 on/3 off)	2.5	0.1
10 (5 on/2 off)	2	0.08
12 (4 on/6 off)	2.5	0.1

5 ANALYSIS OF DUST

Certified Industrial Hygienists develop and review the respirable dust program at Kogan Creek Power Station. A dust monitoring program is developed on an annual basis, based on the findings of the baseline monitoring program. Refer to CS-OHS-75 Health Hazard Exposure Management and the 3-year monitoring schedule.

5.1 Kogan Creek Power Station Similar Exposure Groups (SEGs)

Similar Exposure Groups (SEGs) have been identified at Kogan Creek Power Station. SEGs are groups of workers who have the same general exposure to risk, for example;

- The similarity and frequency of the tasks they perform
- The materials and processes with which they work
- The similarity of the way they perform tasks

SEGs at Kogan Creek Power Station include;

- Administration
- Shift Production Operators/Plant Control Operators

- Mechanical Maintenance
- E&IC Maintenance
- Ash and Coal Processing
- Field based Supervisors
- Technical Services
- Chemical Operations
- Facilities Maintenance
- Warehouse

The results of personal sampling for groups of workers performing similar tasks or working in the same area can be combined and analysed using statistical tools to provide an estimate of exposure for the SEG.

5.2 Dust Sampling

Sampling for inhalable and respirable dusts is undertaken in accordance with AS 3640-2009: Workplace atmospheres—Method for sampling and gravimetric determination of inhalable dust and AS 2985-2009: Workplace atmospheres—Method for sampling and gravimetric determination of respirable dust.

Sampling at Kogan Creek Power Station is done in 2 ways;

- Personal sampling – a dust measurements collected from within the breathing zone of the worker for at least 80% of the shift length.

Real time sampling - a direct-reading device to measure dust concentrations

- DustTrak II Aerosol Monitoring machine that gives you Continuous real-time aerosol mass readings and monitors and measures aerosol contaminants such as dust, smoke, fumes and mists within the perimeter of power station. The devise is used in conjunction with CGC site monitoring.

Following the collection of the minimum number of required samples in the SEG, occupational hygienists use descriptive and inferential statistics to estimate personal exposure.

Laboratories performing analysis of respirable dust samples are certified to ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories for the gravimetric determination of respirable dust and for the analysis of respirable crystalline silica.

- Void or invalid samples will be noted but not used for estimating personal exposure

5.3 Contractor Management

All contractors outside of set Overhaul and Outage period will come under the CS Energy dust management strategy in line with full time CS Energy employees.

Due to there being an increase in dust exposure and an increase in numbers of workers during an Overhaul period the management of dust will be incorporated into the Overhaul Safety Management Plan. CS Energy will commission additional dust sampling during the Overhaul period.

5.3.1 Investigating Exceedances

Where a single air monitoring sample exceeds the exposure standard or is measured at 50% of OEL, or it is likely the worker has been exposed to respirable dust that exceeds the exposure standard an investigation is required to determine if control measures were effective at the time of sampling or what additional control measures need to be implemented.

It may be necessary to resample a SEG following an exceedance if determined by the investigation.

A personal letter will be sent to the monitored worker where an exceedance was measured.

5.3.2 Dust Sampling Equipment

Equipment used to sample respirable dust should be subject to periodic calibration and maintenance, if relevant, as per *Australian Standard 2985-2009 Workplace atmospheres – Method for sampling and gravimetric determination of respirable dust* (AS 2985). Records of calibration must be kept.

6 DUST CONTROL STRATEGY

A Dust Improvement Plan (refer to Kogan Creek Power Station Annual Improvement Plan – Respirable Dust Management) is developed on an annual basis to identify sources of dust generation which covers the following matters;

- identify sources of dust generation
- develop and implement dust controls for each activity
- follow the hierarchy of controls to manage the risk of dust exposure - the primary aim should be to limit dust exposure via the control of excessive dust emissions rather than relying on respiratory protective equipment which should be used as a secondary measure
- incorporate dust control measures into shift and daily routines and these are documented and adequately resourced in short-term and long-term planning processes
- review the effectiveness of controls in a systematic way
- inspect, maintain and monitor controls and equipment (by appropriately trained and competent persons).

6.1 Hierarchy of Controls

6.1.1 Elimination/substitution controls

New Plant:

When preparing specifications for installation of new plant, consider the uncontrolled

discharge of airborne dust from plant into the work environment, dust suppression systems,

maintenance schedules including inspection and repair of all seals where dust may escape.

Existing plant:

Maintenance and regular checks of existing equipment to ensure design of plant keeps

dust enclosed. If plant is modified, consideration must be given to eliminating dust emissions and a plant modification process will be followed – refer to CS-AM-010 Plant Modification Procedure.

6.1.2 Engineering controls

Mechanical handling:

Consider mechanical, automated and remotely controlled methods (minimise exposure to workers)

Operations:

The feed rate to all coal conveyers has been lowered to allow the coal to settle and the dust in turn can be managed more effectively.

Ventilation:

Dilute ventilation, local exhaust ventilation (e.g. welding bays, dust extraction using industrial fans for extraction.) Implement dust suppression measures where dust generation is visible.

Dust Suppression:

Use of dust suppression measures such as water trucks are used on unsealed roads and access tracks.

Use of water sprays and alternative dust suppression measures to manage dust generation from stockpiles and fuel supply system. Stockpile - Production processes that generate less dust by trialling Dust Seal – 81620 on stock pile.

Sealants:

Dust Seal – 81620, Kogan Creek Power Station will be conducting a trial on coal stock pile.

6.1.3 Isolation, segregation or enclosure

6.1.3.1 Isolation

Earth Moving Equipment:

Enclosed cabins with windows closed, HEPA filters on excavators and dust seals in equipment.

Plant:

No enclosed area.

6.1.3.2 Exclusion Zones

Exclusion zones:

Exclusion zones may be necessary to protect workers in the vicinity from exposure to respirable dust. Signs should warn that there is a dust hazard present and access must be restricted to authorised persons - refer to CS-OHS-36 Barricades and Signage Procedure.

6.1.4 Administrative controls

Housekeeping:

Good housekeeping must be maintained in work areas, regularly remove accumulated dust. Undertake regular inspections of the active work area in particular where known dust emissions occur. Schedule inspections and audits, identifying and implementing contingency actions.

Servicing and maintenance:

Machinery, plant, other production equipment regularly maintained (including spray water). Maintain all dust covers, water sprays, dust extraction systems and other dust suppression systems and measures in good working order.

Take into consideration the wind speed, direction and the strength of temperature inversions in order minimise the impact of windblown dust

Information, training, instruction and supervision:

Familiarise all personnel associated with dust management activities with the requirements of this procedure. Include information on dust management requirements in site inductions or site communications where relevant. Conduct toolbox talks and develop environmental site notices and environmental awareness posters periodically highlighting dust management requirement

6.1.5 Personal Protective Equipment

Respiratory protective equipment (RPE):

Should never be used as the primary means for exposure control.

In all uses of RPE, a RPE program should be established in accordance with applicable sections of AS/NZS 1715:2009, *Selection, use and maintenance of respiratory protective equipment*, for particular filter respirators. RPE should be suitable for the task being performed. If relevant, a Safety Data Sheet (SDS) should be referred to ensuring the correct RPE is chosen.

Fit Testing:

Personnel required to utilise respiratory protective equipment are provided with appropriate training on the use and care of the device and will undergo testing at least annually to ensure that the device issued provides adequate individual protection.

Facial hair, including beards, moustaches, sideburns and stubble, will stop a respirator from sealing properly. Workers who are required to wear tightfitting respirators, must be clean-shaven to allow a good seal of the respirator to the face.

Fit testing should be carried out by a competent person:

- each time a new make or model of respirator is issued;
- whenever there is a change in the wearer's facial characteristics or features which may affect the facial seal (e.g. large weight loss or gain).

Maintenance of RPE:

Respiratory protective equipment must be maintained and stored free from dust and water. If RPE is damaged it must be replaced. The user must check the equipment each time before use to ensure there is no damage to the equipment.

6.2 Review Control Measures

Reviewing the effectiveness of control measures can be done in a number of ways;

- Additional air monitoring
- Reviewing current control measures are implemented, following an exceedance investigation
- Consult with workers

- Conduct workplace inspections
- Analyse incident reports and statistical data

  Review the site risk register

7 HEALTH MONITORING

Respiratory health assessments may be necessary if a worker is exposed to a dust concentration greater than the recommended OEL. A Chief Medical Officer has been nominated to complete the respiratory health assessment for all CS Energy workers. This is available for any worker who wishes to utilise this service at the expense of CS Energy. At a minimum the following techniques will be used to check a worker's respiratory health;

- A chest X-ray to be reviewed by two qualified b-readers with additional readers available for adjudication. A b-reader is a radiologist who has undertaken specialised training to detect coal dust lung diseases such as coal workers' pneumoconiosis, silicosis, mixed dust pneumoconiosis and progressive massive fibrosis.
- Spirometry (lung function) testing which is used to detect conditions such as emphysema, bronchitis, dust induced fibrosis and acute silicosis.

In addition, spirometry will be provided on site through the CS Energy voluntary health checks through the Chief Medical Officer. All workers will have baseline spirometry testing done as part of the pre-employment medical.

if the results of these tests are positive then a referral will be made to a respiratory physician for further investigations and diagnosis.

The Chief Medical Officer will complete an annual assessment of all hygiene monitoring completed and give advice of further recommendations for health surveillance.

8 REPORTING AND RECORD KEEPING

Personal records of monitoring must be kept confidential for at least 30 years after the record is made (40 years for reports relating to asbestos exposure).

8.1 Informing the worker

Where an exceedance is measured for an individual, the worker will receive a personal letter informing them of the sampling results. Affected individuals must be involved in the investigation to ensure effective control measures have been implemented. Workers in the SEG will be informed through toolbox meetings of monitoring results, in particular if an exceedance has occurred in their area.

8.2 Informing the Health, Safety and Environment Committee

Results of findings from the hygiene monitoring program will be presented at the Kogan Creek Power Station Health, Safety and Environment Committee. Individual's names will not be discussed but findings from the monitoring program, affected SEGs and corrective measures will be discussed.

8.3 Informing the Regulator

A summary of analytical results will be submitted to the WHS Regulator, including;

- the nature of the sample results
- details of results where a Single Sample Exceedance Result occurred (including details of existing controls in use and if RPE was in use, the type of RPE)
- the relevant work group where a Single Sample Exceedance Result has occurred
- any interim corrective actions, including:
  - what is being considered
  - the process for consideration
  - how actions will be determined.

In addition, the Regulator should be informed as soon as reasonably practicable following the investigation and the decision-making process relating to further action.

9 DEFINITIONS

Term	Definition
HRA	Hygiene Risk Assessment is a documented assessment of health hazards and qualitative risk assessments at CS Energy
Occupational Hygiene	Occupational hygiene uses science and engineering to measure the extent of worker exposure, and to design and implement appropriate control strategies to prevent ill health caused by the working environment. It helps employers and employees understand the risks and promotes improved working conditions and working practices.
OEL	Occupational Exposure Limit is the maximum permissible concentration of a given gas, vapour, fibre or dust in the air in the workplace
Qualitative Hygiene Risk Assessment	Evaluation of potential personal exposure to workplace chemicals, physical, radiological, and/or biological agents based on personal experience and professional judgment.
Quantitative Hygiene Risk Assessment	Evaluation of actual personal workplace exposure to chemical, physical, radiological, and/or biological agents using accredited numerical and mathematical analysis.
SEG	Similar Exposure Groups are groups of workers who have the same general exposure to health and hygiene risk

10 REFERENCES

Reference No	Reference Title	Author
	Work Health and Safety Act 2011	Qld Government
	Work Health and Safety Regulation 2011	Qld Government
	Managing respirable dust hazards in coal fired power stations Code of Practice	Qld Government
B/D/17/15574	Hygiene Risk Assessment (HRA) - Kogan Creek Power Station	GCG
K/D/18/6003	Kogan Creek Power Station Annual Improvement Plan – Respirable Dust Management 2018/2019	CS Energy
K/D/19/2032	Kogan Creek Power Station Mechanism of Dust Register – Task and Plant. Annual Improvement Plans	CS Energy
B/D/17/17210	CS-OHS-75 Health Hazard Exposure Management	CS Energy
B/D/10/7377	CS-AM-010 Plant Modification Procedure	CS Energy
B/D/12/11085	CS-OHS-36 Barricades and Signage Procedure.	CS Energy
B/D/11/30966	Asbestos Management Plan	CS Energy
	Hygiene Monitoring Schedule.	CS Energy
	AS 2985-2009: Workplace atmospheres—Method for sampling and gravimetric determination of respirable dust	
	AS 3640-2009: Workplace atmospheres—Method for sampling and gravimetric determination of inhalable dust	
	ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories	
	AS/NZS 1715:2009, *Selection, use and maintenance of respiratory protective equipment*,	
B/D/18/11305	CS Energy HS Handbook	CS Energy

11 RECORDS MANAGEMENT

In order to maintain continual improvement, suitability, safety and effectiveness of the organisation, CS Energy's registered documents will be reviewed on a two-yearly basis or at intervals specified by legislative or regulatory requirements. Review of controlled documents should occur where it has been identified that there are changes in technology, legislation, standards, regulation or where experience identifies the need for alteration to the content. Registered documents should also be reviewed following an incident, change management process, modification or where directed as part of a risk assessment process. A 'review' can simply mean that it has been identified, confirmed and appropriately recorded that no changes are required and that the existing process remains the same.

CS Energy must ensure that records are retained according to accountability, legal, administrative, financial, commercial and operational requirements and expectations. In compliance with records retention and disposal, all documentation created in relation to CS Energy business must be retained in line with minimum retention periods as detailed in legal retention and disposal schedules.