



**Trade &
Investment**

GUIDELINES

MDG 3002

SSAI No 2

Fatal accident

Oakdale Colliery

3 March 1992

June 1993

Note: This publication has been produced electronically with original content as published by Mineral Resources NSW in 1995.

Produced by Mine Safety Operations Branch

NSW Trade & Investment

516 High St, Maitland NSW 2320

PO Box 344, Hunter Region Mail Centre NSW 2310

Ph: 02 4931 6666

Fax: 02 4931 6790

Web: www.dpi.nsw.gov.au/minerals/safety



**DEPARTMENT OF MINERAL RESOURCES
NEW SOUTH WALES
COAL MINING INSPECTORATE**

**SYSTEM SAFETY ACCIDENT INVESTIGATION
SUMMARY**

**FATAL ACCIDENT
OAKDALE COLLIERY
3 MARCH 1992**

Foreword

In 1991 the Coal Mining Inspectorate of the New South Wales Department of Mineral Resources adopted a methodology for accident investigation known as System Safety Accident Investigation (SSAI). This has been employed since that time to form the basis for the investigation of fatalities and more serious accidents occurring in the coal mining industry in New South Wales.

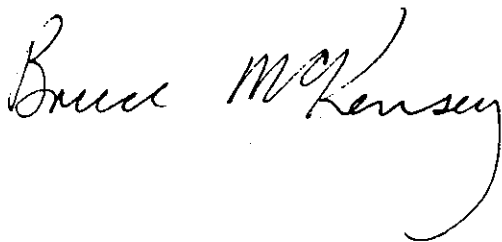
SSAI consists of an accident investigation framework based on a number of 'tools'. These tools allow an investigation team to systematically examine: events and conditions related to an accident; management systems in place at the time of an accident; the transfer of damaging energy in the accident situation together with examination of in place or potential barriers to that energy flow; and certain behavioural aspects of those involved in an accident.

The team may also formulate a 'Team Management Standard' which comprises steps the team recognises as desirable to plan, organise, direct and control operations similar to those in an accident situation. This 'Standard' may be used to identify improvements desirable in the accident scenario and provide an audit tool for evaluation of other similar operations.

The structured nature of information arising from SSAI processes makes it a potentially very valuable tool for others to use in assessing operations which may be similar to those examined in an investigation.

In order that some positive outcome may result from what are otherwise distressing incidents, the Coal Mining Inspectorate is distributing summaries resulting from SSAI's which it has conducted. This is being done with a recognition that accidents result from failures in systems rather than unsafe acts of individuals and is intended to be an information transfer to industry of lessons learned in the course of investigations.

Those with a particular interest may obtain a full copy of the SSAI report on which this summary is based by contacting the team leader identified herein.



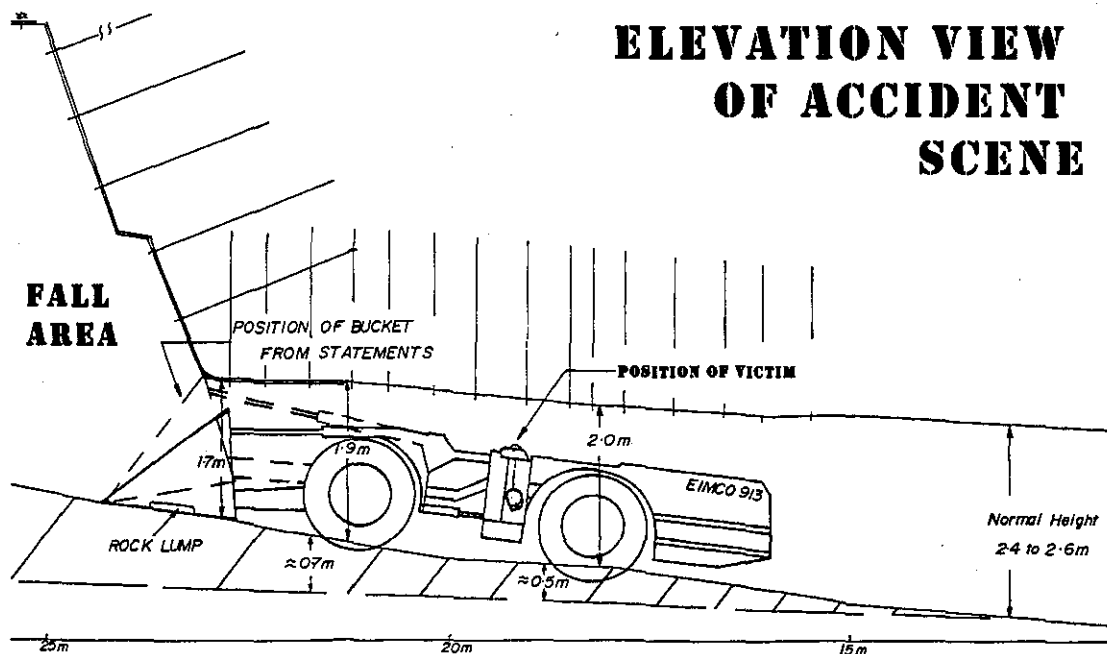
Bruce McKensy
Chief Inspector of Coal Mines
March 1993

OVERVIEW

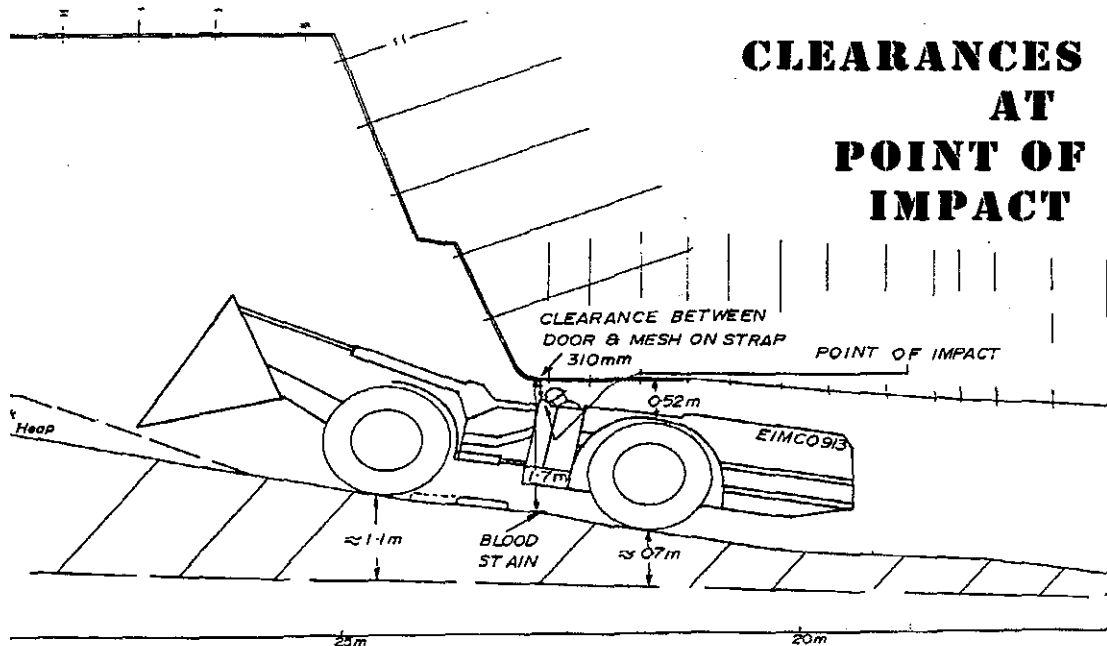
A contractor employed by Allied Constructions suffered severe head injuries from which he died whilst in transit to hospital. The incident occurred underground in the main east intake roadway at Oakdale Colliery in the Burraborang Valley at approximately 0915 on 3 March 1992. At the time the victim was cleaning up roof stone at a roof fall in workings adjacent to the mine transport road.

He was working alone operating an EIMCO 913 LHD diesel vehicle and, when found by another employee, was slumped in the drivers compartment of the vehicle bleeding profusely from the left side of his head. His helmet and caplamp were hanging over the back of the drivers compartment. The bucket of the vehicle was elevated under the 'lip' of the fall cavity - the motor of the vehicle was running with the drive wheels still rotating.

An elevation view of the accident area is shown below.



It appears most likely that the victim's head was crushed between the structure of the Eimco and the lip of the fall as the machine was being reversed while back blading material from the fall area. Clearances at the likely point of impact are indicated in the diagram overleaf.



SYSTEM SAFETY ACCIDENT INVESTIGATION

An investigation by the Department of Mineral Resources, Coal Mining Inspectorate was conducted as a System Safety Accident Investigation (SSAI). This method of investigation was originally developed by the United States Department of Energy and makes use of a number of 'tools' to examine events and conditions related to an accident, management systems in place at the time of the accident, and the adequacy or otherwise of barriers (possible or in place) to prevent unwanted energy flows in the accident situation.

Findings (or inferences) from each of these tools are then grouped by related subject matter and these groups of findings form a basis for the drafting of 'Judgements of Needs'. Judgements of Needs are a means used to identify areas for development of engineering controls or management systems to mitigate personal injury or damage in operations similar to those of the accident situation. Judgements of Needs are intended to identify but not replace the development of such controls or systems.

The investigation team consisted of:-

- Mr Leo Roberts, Senior Inspector of Mechanical Engineering (Team leader)
- Mr Jeff Conlon, District Inspector of Coal Mines
- Mr Roger Hoerndlein, Inspector of Mechanical Engineering
- Mr Ron Smith, Senior Inspector of Coal Mines (Part time team member)
- Mr Paul DeGruchy, Senior Technical Officer

SSAI OUTCOMES

The investigation resulted in Judgement of Needs related to: operation of free steered vehicles (FSV's) in mine environments; design of FSV operator compartments; and, management of contractors on mine sites. Those with industry significance are reproduced below for the information of industry, equipment manufacturers/suppliers, regulators and other interested parties.

In addition, a draft "Code for Free Steered Vehicle Driver Compartments" with application to underground coal mines has been prepared by the Coal Mining Inspectorate.

JUDGEMENT OF NEED # 4

ACCIDENT INVESTIGATION RESULTS		Date: 3/3/1992
Location: OAKDALE COLLIERY	Type of Accident/Incident: FATALITY/ OPERATION OF FSV WITH RESTRICTED HEADROOM.	
General Issues: OPERATION OF FSVs IN NSW UNDERGROUND COAL MINES.	Areas of Implication: MINING INDUSTRY	
JUDGEMENT OF NEED: THERE IS A NEED TO REVIEW THE USE OF ALL FSVs IN NSW UNDERGROUND COAL MINES TO ASCERTAIN THEIR COMPATIBILITY WITH EXISTING UNDERGROUND ROADWAY DIMENSIONS, SO THAT THE POTENTIAL OF INJURY TO DRIVER FROM CONTACT WITH ROOF, RIB AND ASSOCIATED ROADWAY SUPPORTS IS ELIMINATED.		
RELATED FINDINGS: 1. ALL HAZARDS IN UNDERGROUND ROADWAYS WHICH MAY INJURE FSV OPERATORS SHOULD BE IDENTIFIED AND APPROPRIATE PROTECTION DEVELOPED. AREAS TO BE ADDRESSED INCLUDE:- PROTRUDING ROOF AND RIB BOLTS, CANCHES, VEHICLE LIFTING, TILTING AND TIPPING UNDER LOAD. 2. TRANSPORT RULES TO BE REVIEWED TO ENSURE USE OF ALL FSVs ARE ADEQUATELY COVERED WITH RESPECT TO OPERATOR PROTECTION. 3. DEVELOPMENT OF A POLICY FOR PURCHASE OF NEW OR UPGRADING OF EXISTING FSVs. POLICY TO INCORPORATE REQUIREMENTS FOR OPERATOR SAFETY AS A PRIME ASPECT OF THE SELECTION CRITERIA E.G. SPATIAL CONSTRAINTS FOR SAFE WORKING CLEARANCES, OPERATOR PROTECTION, ERGONOMIC ISSUES SUCH AS VISIBILITY, DRIVER COMFORT. 4. REVIEW PROCEDURES FOR SELECTION, TRAINING, APPOINTMENT OF OPERATORS WHICH INCLUDES THEIR RESPONSIBILITIES. 5. THE SYSTEM GOVERNING THE USE OF FSVs TO BE FLEXIBLE TO ENABLE ANY RISK ARISING FROM ABNORMAL SITUATIONS TO BE RECOGNISED AND EFFECTIVELY MANAGED.		
DISCUSSION OF FINDINGS: THE TEAM CONSIDERED THAT THERE IS A LACK OF RECOGNITION BY INDUSTRY TO PROVIDE AN OPTIMUM SAFE ENVIRONMENT FOR OPERATORS AS AN INTEGRAL PART OF FSV SELECTION AND THEIR APPLICATION.		

JUDGEMENT OF NEED # 5

ACCIDENT INVESTIGATION RESULTS

Date: 3/3/1992

Location: OAKDALE COLLIERY

**Type of
Accident/Incident:**
FATALITY/ OPERATION
OF FSV WITH
RESTRICTED HEADROOM.

General Issues:
DESIGN OF OPERATOR
COMPARTMENTS FOR FSVs.

Areas of Implication:
MANUFACTURERS/SUPPLIERS
OF FSVs FOR USE IN
UNDERGROUND COAL MINES.

JUDGEMENT OF NEED:

THERE IS A NEED FOR FSV MANUFACTURERS TO INVESTIGATE THE POTENTIAL OF INJURY TO DRIVERS OF FSVs FROM CONTACT WITH ROOF, RIB AND ASSOCIATED ROADWAY SUPPORTS AND TO REDESIGN / UPGRADE OPERATOR COMPARTMENTS TO NEGATE THIS HAZARD.

RELATED FINDINGS:

1. MANUFACTURERS OF FSV's HAVE A RESPONSIBILITY TO PROVIDE OPERATOR PROTECTION SUITABLE FOR THE ENVIRONMENT UNIQUE TO UNDERGROUND COAL MINES.
2. MANUFACTURERS' DESIGN POLICY SHOULD INCORPORATE REQUIREMENTS FOR OPERATOR SAFETY AS A PRIME ASPECT e.g. SPATIAL CONSTRAINTS FOR SAFE WORKING CLEARANCES, OPERATOR PROTECTION, ERGONOMIC ISSUES SUCH AS DRIVER'S VISION AND COMFORT.
3. MANUFACTURERS TO PROVIDE SPECIFICATIONS FOR SAFE USE OF FSVs e.g. MAXIMUM GRADES, MAXIMUM WORKING WIDTHS AND HEIGHTS, DRIVER TRAINING FOR ASPECTS UNIQUE TO A PARTICULAR TYPE OF FSV.
4. MANUFACTURERS SHOULD INVESTIGATE THE USE OF HARD BARRIERS TO DETECT WHEN ROADWAY HEIGHT BECOMES LOWER THAN FSV OPERATOR PROTECTION.

DISCUSSION OF FINDINGS:

ADEQUATE OPERATOR ACCOMMODATION SHOULD BE CONSIDERED AN ESSENTIAL ASPECT IN FSV DESIGN

JUDGEMENT OF NEED # 6

ACCIDENT INVESTIGATION RESULTS		Date: 3/3/1992
Location: OAKDALE COLLIERY	Type of Accident/Incident: FATALITY/ OPERATION OF FSV WITH RESTRICTED HEADROOM.	
General Issues: EMPLOYMENT OF CONTRACTORS IN UNDERGROUND COAL MINES	Areas of Implication: ALL NSW UNDERGROUND COAL MINES/CONTRACTORS.	
JUDGEMENT OF NEED: THE TEAM CONSIDERED THAT THERE IS A NEED FOR MINE MANAGEMENT AND CONTRACTORS TO DEVELOP PROCEDURES WHICH IDENTIFY AND CLEARLY DEFINE AREAS OF RESPONSIBILITY FOR SAFETY, HEALTH AND WELFARE OF ALL EMPLOYEES INVOLVED IN CONTRACT WORK IN UNDERGROUND WORKINGS.		
RELATED FINDINGS: 1. PRIOR TO COMMENCEMENT OF EMPLOYMENT OF CONTRACTORS A FORMAL CONTRACTUAL AGREEMENT BETWEEN MINE MANAGEMENT AND CONTRACTOR NEEDS TO BE IN PLACE. THIS AGREEMENT MUST INCLUDE DETAILED SCOPE OF WORK AND ALLOCATION OF RESPONSIBILITIES TO ENSURE THAT A SAFE WORKPLACE IS PROVIDED AND MAINTAINED (i.e. HAZARD IDENTIFICATION PROCESS). 2. THE SCOPE OF WORK NEEDS TO MAKE PROVISIONS FOR RECOGNITION OF HAZARDS ARISING FROM ABNORMAL SITUATIONS WHICH MAY DEVELOP DURING THE WORK PROGRAM. 3. CONTRACTORS HAVE RESPONSIBILITY TO TRAIN THEIR EMPLOYEES TO AN ACCEPTABLE STANDARD OF COMPETENCE RELATING TO THEIR POSITION AND NOT RELY PURELY ON TRAINING SCHEMES IN PLACE AT MINE. 4. CONTRACTORS NEED TO PROVIDE FULL DOCUMENTATION OF THEIR EMPLOYEE'S TRAINING, WORK EXPERIENCE AND QUALIFICATIONS TO MINE MANAGEMENT SO THAT THERE IS A CLEAR UNDERSTANDING OF EACH EMPLOYEE'S DEGREE OF COMPETENCE. 5. MINE MANAGEMENT NEEDS TO ENSURE THAT NO CONTRACTOR'S EMPLOYEE IS PERMITTED TO CARRY OUT WORK WHICH MAY BE HAZARDOUS DUE TO LACK OF COMPETENCE OR ADEQUATE SUPERVISION.		
DISCUSSION OF FINDINGS: THE TEAM ESTABLISHED THAT:- (a) CONTRACTORS TEND TO DEFER ALL THE RESPONSIBILITIES OF THE EMPLOYER, CONCERNING OCCUPATIONAL HEALTH AND SAFETY FOR EMPLOYEES, TO MINE MANAGEMENT. (b) LIAISON BETWEEN CONTRACTORS AND MINE MANAGEMENT NEEDS TO BE REVIEWED TO ENSURE EFFECTIVE MANAGEMENT OF RISK EXISTS. (c) THE POTENTIAL FOR CONFUSION OF RESPONSIBILITIES FOR SAFETY OF PERSONS WORKING IN MINES CAN EXIST DUE TO THE FOLLOWING: (i) THE OHS ACT PLACES RESPONSIBILITY ON EMPLOYERS (i.e. CONTRACTORS) FOR SAFETY OF THEIR EMPLOYEES (REFER SECTION 15). (ii) OHS ACT ALSO PLACES CO-RESPONSIBILITY ON EMPLOYERS (i.e. MINE MANAGEMENT) FOR SAFETY OF PERSONS WORKING AT MINE NOT IN HIS EMPLOY (REFER SECTION 16) (iii) THE CMRA PLACES RESPONSIBILITY FOR SAFETY OF ALL PERSONS WORKING AT MINE WITH MINE MANAGER (REFER SECTION 37(1)(d)).		