Department of
Conservation & Land Management
Western Australia

ACCIDENT INVESTIGATION
&
REPORTING MANUAL

Conservation and
Land Management

CONSERVATION AND LAND MANAGEMENT

INSTRUCTION MANUAL

for

use of

GUIDE FOR IDENTIFYING CAUSAL FACTORS AND PREVENTIVE ACTIONS

and

PERSONAL INJURY ACCIDENT REPORT FORM

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Acknowledgement is given to
The National Safety Council of America
for the original concepts used in this Manual.

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INTRODUCTION

Every man and woman working for the Department of Conservation and Land Management has the right to expect a safe and healthy work place, and a commitment from management to prevent industrial accidents or ill-health.

I accept this obligation, and assure you all of the commitment of my senior staff.

To assist in our safety programme, we are introducing a new system of accident investigation and reporting. I believe that this new system is practical, understandable and acceptable. It also is computer compatible and prevention orientated. It is a systematic way of investigating and reporting accidents which will lead to a reduction in our accident rate and more efficient management of our Department.

To achieve success in these efforts the co-operation of everybody working in CALM is essential. I am asking for your unreserved support in implementing and operating this program.

Syd Shea
EXECUTIVE DIRECTOR

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

POLICY DIRECTORATE

ADMINISTRATIVE INSTRUCTION NO. 6

File ref: 342/82
DBJ:sp

DEPARTMENTAL SAFETY AND OCCUPATIONAL HEALTH POLICY

The Department of Conservation and Land Management is committed to ensuring the highest possible standards of occupational health management and safety for all its personnel.

These standards can be achieved if the principles of safety and health management are understood and implemented.

Each individual has a responsibility to develop safe and healthy work practices and conditions. In doing so, personnel will have the full backing of the Executive Director and of senior management.

The safety and occupational health policy is:

1. The Department recognises the importance of the safety and health of its personnel.

2. The department will provide safe working conditions by seeing that every effort is made to avoid, remove and remedy the causes on industrial accidents or occupational ill-health.

3. Safety and health will be included on the agenda of all formal Departmental meetings, where applicable.

4. Management will provide effective leadership and example.

.../cont

5. All personnel will receive training in safety and occupational health.

6. Safety and health rules will be formulated and put into practice.

7. Officers in charge will account for all accidents within their Region/District/Section. Immediate supervisors will investigate accidents.

8. Personal safety practice, example to others and efforts towards job safety and health management will be considered together with professional skill, directing ability, organising capacity and other qualities when assessing the efficiency of personnel.

9. Every accident resulting in loss of time or medical treatment will be investigated and an investigation report completed. all non-injury accidents which are repetitive or have a serious potential, or instances of the work environment endangering personnel health and fitness, will also be investigated and a report form completed.

10. Employee safety suggestions will be sponsored, e.g. safety induction fitness programmes etc.

11. The Department will provide first aid outfits and protective equipment.

12. Each working unit (e.g. District, Region, Research Station) shall form a Safety Committee consisting of representatives from all categories of personnel in the unit and the Officer-in-Charge. Meetings shall take place at least every three months.

Distribution:
LIST 'D'

Syd Shea
EXECUTIVE DIRECTOR

1. ACCIDENT INVESTIGATION - A MANAGEMENT COMMITMENT

A systematic approach to accident investigation, identification of causal factors, and implementation of preventive actions is essential to a good safety and health program and management system.

A less orderly approach can increase the potential for injury and financial loss. Good accident investigation procedures:

- Provide information needed to determine injury rates, identify trends or problem areas, permit comparisons, and satisfy workers' compensation requirements
- Identify, without placing blame, the basic causal factors that contributed directly or indirectly to each accident
- Identify deficiencies in the management systems set up to control accidents
- Suggest preventive action alternatives for a given accident
- Suggest preventive action alternatives for the management system

This manual provides management supervisors, and safety personnel with a way to focus on determining those factors that cause accidents so they can recommend effective preventive actions. Its emphasis on causal factors and preventive action sets this manual apart from most other guides to investigative techniques. It provides management with a powerful tool to improve safety performance and reduce the human suffering and financial loss caused by accidents.

The fact that an accident occurred usually means something went wrong in the management system. There was an oversight, an omission, or a lack of control of circumstances that permitted the accident to occur. The accident investigation process must determine not only the causal factors that contributed to a given accident, but also the deficiencies in the management system that permitted the accident to occur.

A good accident investigation will usually yield a number of causal factors and preventive actions. The preventive actions selected should include both the specific measures needed to eliminate or reduce the probability of recurrence of a given type of accident and the measures needed to improve the management system.

When management insists on excellence in safety performance, it shows its respect for human values. It also is likely to achieve greater productivity, improved quality, lower production costs, and increased profits.

An effective accident investigation requires strong management commitment and involvement. Management must support the investigation process and act on the results. It must make sure that the investigators are capable and have sufficient resources for an adequate investigation. Otherwise, the investigation may fail to uncover serious problems, including defects in the management system that could lead to other accidents and to inefficiencies.

When management fails to show strong support, employees are likely to

believe that it is not seriously committed to safety. But management's commitment is demonstrated when a vigorous, objective investigation is conducted, with high management visibility and a focus on uncovering causal factors rather than placing blame, and the investigation is followed by decisive action to correct deficiencies. This demonstration of management's attitude can not only enhance productivity; it can encourage employee cooperation and interest in maintaining a safer workplace.

2. PRINCIPLES OF ACCIDENT INVESTIGATION

An **accident** is an unplanned, undesired event that results in personal injury or property damage. An accident investigation should determine **what** happened, **how** it happened, and **why** it happened, and what should be done to prevent similar accidents.

The method presented in this manual is flexible.

Flexibility, however, does not mean abandoning common sense. The investigation should be limited to factors that relate directly to the accident.

The investigation should follow a sound plan, developed and tested **before** an accident occurs. The plan should guide the investigators from the moment they learn of the accident until they release the final report. Following the plan described in this manual will lead to the best results although unusual circumstances may dictate occasional deviations from the tested, structured approach.

Investigation Criteria

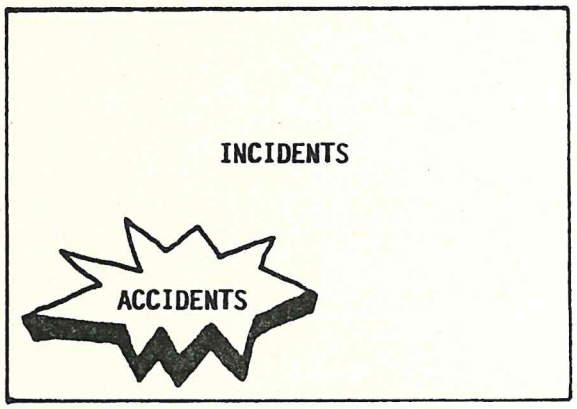


FIGURE 1: Accidents are a part of a broad group of events that adversely affect the completion of a task. All of the events in this group are called incidents.

All Lost Time Accidents should be investigated, regardless of the extent of injury or property damage.

An accident that involves injuries requiring medical treatment normally requires extensive investigation.

An accident that doesn't involve injuries but involves significant property damage, also will normally require extensive investigation.

An accident that involves only first aid or very minor property damage should be investigated, but will not require extensive investigation. An extensive investigation is warranted, however, if there was a potential for more serious consequences.

An **incident** is an unplanned, undesired event that adversely affects completion of a task. All accidents are incidents. Incidents that have the potential to result in personal injury or property damage should be investigated in the same way that accidents are investigated.

To minimize special terminology, this manual's use of the term **injury** includes any illness that results from a single or identifiable event, and its use of the term **safety** includes occupational health.

No Blame Placing

The aim of any accident investigation is to identify the causal factors and recommend preventive actions that will emininate or minimise them. Investigators should avoid any emphasis on identifying the individuals who could be blamed for the accident. Looking for someone to blame jeopardizes the investigators' credibility and effectiveness and will usually reduce the quantity and accuracy of the information recevied.

This does not mean that relevant oversights or acts of omission or commission on the part of hourly employees, supervisors, or other management personnel should be ignored. Many accidents result from actions someone did or did not do, know about, or judge correctly.

Investigation Group

The size and makeup of the investigation group should be dictated by the accident's seriousness or complexity. The supervisor alone, or with the help of the employees involved, usually investigates cases resulting in Lost Time Accident (LTA), Medical Treatment Accident (MTA), minor injury or property damage.

The group for a major investigation involving a serious injury, a fatality, or extensive property damage might include the employee(s) directly involved, the supervisor, safety personnel, technical specialists, and employees familiar with the process or operation. If there is a fatality or a major property damage accident, the team may include Head Office safety and health staff and Head Office officers. A group can add more members as the investigation uncovers complications, injury, or damage potential that was not recognized when the group was formed.

Action Plan

When an accident occurs, the investigator(s) must be ready to act immediately to turn chaos into order. There's no time for training after the accident. Investigator(s) need advance training and preparation so they can act promptly and effectively.

Local management should adopt a written action plan for group investigations. The plan should provide for:

. Identification of the individual who is in charge and assigns responsibilities

. Authority to conduct the investigation

. Prompt notification of group members that specifies when and where they should report

. Instructions on the personal protective clothing or special equipment to be worn or brought to the scene

. Provisions for a work area and administrative support

. Transportation and communication, if needed

. Securing the accident site for the duration of the investigation after rescue and damage control are complete

. Provision for access of the group members to the accident site

. Photographic support or capability

. Procedures and equipment to ensure the observation and recording of fragile, perishable, or transient evidence (for example, instrument readings, weather and other environmental conditions, chemical spills, stains, skid marks)

. Development of a comprehensive report

Immediate Action

The safety and health of employees, visitors, and the public must be the primary concerns immediately after an accident. Activities related to the investigation are important, but they are secondary. The first response must be to:

. Take all steps necessary to provide emergency rescue and medical help for the injured.

. Take those actions that will prevent - or minimize the risk of - further accidents, injury, or property damage.

These **immediate actions** are stopgap measures to prevent further adverse consequences.

Determining the Facts in Major Accidents

As stated earlier, the level of effort involved in the investigation largely depends on the seriousness or complexity of the accident. Investigators should perform only those tasks that are pertinent to identification of the causal factors. For a major investigation, the accident investigation group should:

. Visit the accident scene before the physical evidence is disturbed.

. Take samples of unknown chemical spills, vapors, residues, pesticides, and other substances, noting conditions that may have affected the sample.

. Make comprehensive visual records. No one can predict in advance which data will be useful, so photographs should be taken from many different angles and accurate and complete sketches or diagrams should be made before the accident scene is restored.

. Determine which accident-related items should be preserved. These may become critical evidence if there is litigation later. When the investigation reveals that an item may have failed to operate properly, or was damaged, arrangements should be made either to preserve the item as it was found at the accident scene or to document carefully any subsequent repairs or modifications.

. Identify the people who were involved in the accident. Also identify all eyewitnesses, including those who saw the events leading to the accident, those who saw the accident happen, and those who came upon the scene immediately following the accident. Identify others who may have useful information.

. These people should be interviewed as soon as possible. The validity of their statements is highest immediately after the accident. Immediate interviews minimize the possibility that witnesses will subconsciously adjust their stories to fit the interviewer's concept of what occurred or to protect someone involved. Witnesses should be interviewed individually and in private so the comments of one do not influence the responses of others.

. Conduct interviews with everyone who was involved or can provide information. Tactful, skilled investigators usually get uninhibited cooperation from employees by eliminating any apprehension they may have about incriminating themselves or others. Witnesses must be convinced that the investigators want to find the cause of the accident and don't want to place blame. If witnesses provide misleading information, the purpose of the investigation is thwarted and a similar accident may occur again.

. Carefully document the sources of information. This documentatin avoids an unwarranted impression that information actually obtained from third parties is based on the investigator's own observations or analysis. Documentation of information sources can prove

valuable if the accident investigation is expanded at some point or reopened later. Note any contradictory statements or evidence and attempt to resolve discrepancies. If resolution is not possible, indicate which statements or evidence are considered most reliable.

- Review all sources of potentially useful information. These may include original design; design specifications; drawings; operating logs; purchasing records; previous reports; procedures; equipment manuals; verbal instructions; maintenance, inspection, and test records; alteration or change of design records; design data; job safety analysis; records indicating the previous training and job performance of the employees and supervisors involved; computer simulations; and laboratory tests.

Facts must be separated from opinions, direct evidence from circumstantial evidence, and eyewitness statements from hearsay testimony. Investigators should divide the data they collect into the following categories:

HARD EVIDENCE: Data that usually cannot be disputed, such as the time and place of the accident, logs and other written reports, and the position of physical evidence (providing investigators can establish that it has not been moved).

WITNESS STATEMENTS: Statements from persons who saw the accident happen and from those who came upon the scene immediately following the accident.

CIRCUMSTANTIAL EVIDENCE: The logical interpretation of facts that leads to a single, but unproven, conclusion. Investigators should be cautious in handling such physical evidence as pieces of equipment and tools. After visual assessment of the extent of damage or defects, it may be necesary to send this evidence to a laboratory for further analysis of failures or fractures. In such cases, the equipment should be identified, tagged, and secured.

Investigators should not attempt to reassemble failed or damaged equipment at the accident site. Such attempts might prevent an accurate laboratory analysis. It is also unwise to disassemble damaged equipment unless the correct reassembly procedure is known. In most cases, the investigators should determine what analysis is needed and leave the actual analysis to those who are qualified to conduct tests.

If a fatality is involved, investigators should not attempt to determine the cause until a coroner issues a preliminary report indicating a cause.

Investigators must understand that the accuracy and thoroughness with which they obtain and record data will largely determine the quality of the final report and the effectiveness of the preventive actions.

3. THE GUIDE FOR IDENTIFYING CAUSAL FACTORS AND PREVENTIVE ACTIONS

The **Guide for Identifying Causal Factors and Preventive Actions** is the first key document in this manual. A sample appears at the end of this section on pages 22 through 31. Completion of the Guide is essential in this new method. It focuses on the four elements of a basic system: equipment, work environment, people, and management - which brings the first three elements together and controls them. These four system elements are combined to make organisations work efficiently. But sometimes they work together in unexpected ways to produce accidents.

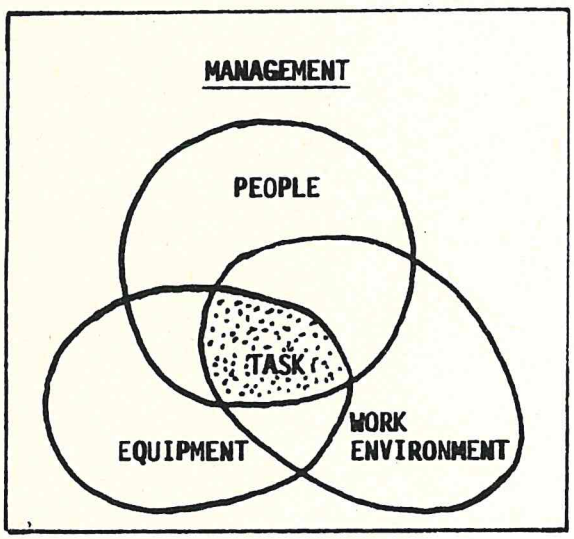


FIGURE 2: A basic system in which people, equipment, and work environment are managed to accomplish a task.

The accident investigation method should focus on three key tasks.

The first is **identification of the causal factors** that resulted in the accident.

The second is **identification of the preventive actions** that will minimize the likelihood of a similar accident and also will minimize the severity or adverse consequences of a similar accident if it should occur.

The third task is **selection of the preventive actions** that have the best chance of reducing the risk.

Identifying Causal Factors

The causal factor identification procedure in the Guide can be applied to any workplace accident. It is based on a simple **YES** or **NO** response to a series of questions. The Guide is divided into four parts: Equipment, Work Environment, People, and Management. Each part has one or two basic questions. Your answers to the basic questions determine how you will proceed through the other questions in that part.

For example, the first basic question in PART I, EQUIPMENT, is "Was hazardous equipment a contributing factor?" If the answer is YES, answer the remaining questions under "Causal Factors". If the answer is NO, proceed to the next part of the Guide.

Answer all questions by placing an X in the "Y" circle or square for YES or in the "N" circle or square for NO.

Marks in the squares will signify that the corresponding items are not causal factors.

Marks in the circles will signify that the items are causal factors.

Since accidents rarely have a single cause, this process usually yields more than one causal factor for each accident.

Use the "Comment" column to the right of the "Causal Factors" questions to record specifics about the accident under investigation.

Provide a comment for each item identified as a causal factor; that is, items for which X's appear in circles.

Identifying Preventive Actions

A preventive action is a response to eliminate a deficiency of some kind. The Guide lists several "Possible Preventive Actions" for each causal factor. These suggested actions are stated in general terms. They guide the investigators in identifying specific preventive actions that relate to the accident they are investigating.

The "Possible Preventive Actions" are intended to strengthen the overall safety programs and eliminate or minimize such management system defects as oversights, omissions, or lack of control. Of course the list of actions in the Guide cannot cover every imaginable contingency. Investigators, therefore, also should consider other preventive actions.

In the "Recommended Preventive Actions" column, list specific preventive actions that can be taken to minimize or eliminate the causal factors that resulted in the accident. The list should include remedies to eliminate defects that have been identified in the management system. Each recommended preventive action should be considered a possibility for implementation. For each **Recommended Preventive Action** indicate where you see the responsibility for implementing the action. i.e. Personal (name), Local Management or Departmental responsibility?

Selecting Preventive Actions

Most investigations will suggest several recommended preventive actions. Usually more than one preventive action from this list of possibilities will be chosen for implementation. Some are bound to be more effective than others. And some are bound to be more costly than others. Factors that usually influence the selection include:

- Effectiveness
- Cost
- Feasibility
- Effect on productivity
- Time required to implement
- Extent of supervision required
- Acceptance by employees
- Acceptance by management

Preventive actions that best fulfill these criteria offer optimum possibilities for reducing risk.

4. THE PERSONAL INJURY ACCIDENT INVESTIGATION REPORT

The preceding sections described general principles and procedures that apply to any accident investigation. Three key documents are presented in this manual to assist with accident investigation. The first key document, the **Guide for Identifying Causal Factors and preventive Actions**, was described in this preceding section. This section tells how to complete the second key document, the **Personal Injury Accident Investigation Report**, a form that serves as an investigation guide and as a record of the facts obtained (see pages 11-12). The third key document, the **Summary of Causal Factors**, helps investigators to compile and analyze data from many accidents.

When used together, the Report and the Guide tell investigators what questions to ask, what factors to investigate, and what other information to document as part of the permanent record of the accident and its aftermath. They also help investigators to identify causal factors and preventive actions.

The Report is designed primarily for investigation of accidents involving injuries, but also can be used to investigate occupational illnesses arising from a single exposure (for example, dermatitis caused by a splashed solvent or a respiratory condition caused by the release of a toxic chemical or gas).

All questions on this form should be answered. If no answer is available, or the question does not apply, the investigator should so indicate. Answers should be complete and specific. Supplementary sheets can be used for other information, such as drawings and sketches, and should be attached to the Report. **A separate form should be completed for each employee who is injured im a multipe-injury accident.**

The individual entries in the Report form are explained below:

REGION, DISTRICT, BRANCH - Enter the region, district and/or branch or other local identification of the work area to which the injured is assigned (for example, maintenance workshop or laboratory). In some cases, this may not be the area in which the accident occurred.

1. **NAME OF INJURED** - Record the last name, first name (and middle initial if known).
2. **SEX**
3. **AGE** - Record the age bracket of the injured.
4. **DATE OF ACCIDENT** - State date of accident or initial diagnosis of illness and date accident reported.
5. **PERSONS USUAL OCCUPATION** - Give the occupation to which the person is **normally** assigned (for example, Ranger, typist, ...).
6. **TASK AT TIME OF ACCIDENT** - Indicate the task on which the injured was working at the time of the accident. In some cases, this may not be the employee's usual occupation.
7. **EXPERIENCE IN TASK AT TIME OF ACCIDENT** - Tick one square to show the experience the injured person had on the task indicated in Item 6.
8. **EMPLOYMENT CATEGORY** - Indicate injured's employment category at the time of the accident.
9. **LENGTH OF EMPLOYMENT** - Tick the appropriate square to indicate how long the person has worked for CALM.

10. **PIECEWORKER** - Tick the appropriate square.
11. **PART OF BODY INJURED** (Tick one square only) - Tick one square to show part of body injured. For multiple injuries tick square 10.
12. **NATURE OF INJURY** (Tick one square only) - Tick one square to show the kind of injury or injuries resulting from the accident.
13. **NAMES OF OTHERS INJURED IN SAME ACCIDENT** (if any) - Enter names of other persons injured in the accident and indicate whether they were CALM employees or not.
14. **TIME OF ACCIDENT**
15. **DAY OF WEEK OF ACCIDENT**
16. **NAME AND ADDRESS OF DOCTOR OR NURSE** who treated injured persons.
17. **DATE FIRST ATTENDED** - Enter date injured person first attended doctor or nurse.
18. **RETURN TO WORK** - Indicate whether injured person returned to normal duties, was given alternate work or was declared unfit for work. Also see medical certificate for guidance.
19. **NAME AND ADDRESS OF HOSPITAL**
20. **SPECIFIC LOCATION OF ACCIDENT** - Tick one square only. Use space to specify location if different from those listed. Attach a diagram or map if it would help to identify location.
21. **SEVERITY OF INJURY** - Check the highest degree of severity of injury. The options are listed in increasing order of severity.

22(a) **WAS A CHAINSAW INVOLVED IN ACCIDENT** - If a chainsaw was involved in any way in the accident please indicate. Details of the part played by the chainsaw in the accident should be entered in Box 26.

22(b) **DID ACCIDENT OCCUR DURING FIRE CONTROL** - if yes, explain details in Box 25.

23. **INJURED PERSON WAS WORKING ALONE/ WITH OTHER WORKERS** - "Working with Others" means that the injured person was directly assisting other persons when the accident occurred.
24. **SUPERVISION AT TIME OF ACCIDENT** - Indicate in the appropriate square whether, at the time of the accident, the injured employee was directly supervised, indirectly supervised, or whether direct supervision was not practicable at the time.
25. **DESCRIBE HOW THE ACCIDENT OCCURRED** - Provide a complete, specific description of what happened. Tell what the injured and others involved in the accident were doing prior to the accident; what relevant events preceded the accident; what objects or substances were involved; how the injury occurred and the specific object or substance that inflicted the injury; and what, if anything, happened after the accident. Include only facts obtained in the investigation. Do not record opinions or place blame.
26. **CAUSAL FACTORS** - Record the causal factors (events and conditions that contributed to the accident) that were identified by use of the **Guide for Identifying Causal Factors and Preventive Actions.** Remember Causal Factors are **identified by the CIRCLES** marked in the **Guide to Identifying Causal Factors and Preventive Action.** It is important to list the guide question no's in the Report.
27. **PREVENTIVE ACTIONS** - Describe the preventive actions taken immediately after the accident to prevent a recurrence, including the temporary or interim actions and the permanent actions. Record other recommended preventive actions selected from the **Guide for Identifying Causal Factors and preventive Actions.** Include any other preventive actions as requested. In each case nominate the **person responsible for action** and the **date action to be completed by.**
28. **SIGNATURES** - Do not delay sending the report form pending signature of injured person. Report form must be sent to Head Office within ten days of accident occurring.

CLM 6

DEPARTMENT OF CONSERVATION & LAND MANAGEMENT

PERSONAL INJURY ACCIDENT INVESTIGATION REPORT

ACCIDENT SERIAL NO.

(Complete the Guide for Identifying Causal Factors and Preventive Actions before completing this form. Please send this form to SOHB within 10 days)

REGION _____ BRANCH _____

DISTRICT _____

1 NAME of INJURED	2 SEX	3 AGE
	☐ M ☐ F	☐ Under 20 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ Over 59

4 (a) DATE of ACCIDENT	5 PERSONS USUAL OCCUPATION	6 TASK at TIME of ACCIDENT (also see 7)	7 EXPERIENCE in TASK at TIME of ACCIDENT
(b) DATE ACCIDENT REPORTED			☐ None ☐ Average ☐ A little ☐ Very Experienced

8 EMPLOYMENT CATEGORY	9 LENGTH of EMPLOYMENT	10 PIECEWORKER
☐ Full Time ☐ Unemployment Relief ☐ Part-time ☐ Seasonal	☐ Less than 3mo ☐ 3 mos to 1 yr ☐ 1-5 years ☐ More than 5yrs	☐ Yes ☐ No

11 PART of BODY INJURED (Tick one box only)

Head	☐ 01	Arm	☐ 04	Trunk/back	☐ 08
Eyes	☐ 02	Hand	☐ 05	Trunk/other	☐ 09
Neck	☐ 03	Leg	☐ 06	Multiple	☐ 10
		Foot	☐ 07	Other	☐ 11

12 NATURE of INJURY (Tick one box only)

Fracture	☐ 01	Amputation	☐ 05	Shock, Heart Attack	☐ 10
Dislocation	☐ 02	Laceration, other open wound	☐ 06	Bite (snake, insect, animal)	☐ 11
Sprain, strain	☐ 03	Contusion, crushing	☐ 07	Multiple	☐ 12
Concussion, other internal	☐ 04	Burn, scald	☐ 08	Other	☐ 13
		Inhalation of gas	☐ 09	Harmful Contacts	☐ 14

13 NAMES of OTHERS INJURED in SAME ACCIDENT (if any)	14 TIME of ACCIDENT	15 DAY of WEEK
	AM	
CALM Employee(s) ☐ Yes ☐ No (please tick)	PM	

16 NAME and ADDRESS of DOCTOR or NURSE (if applicable)	17 DATE FIRST ATTENDED	18 RETURN TO WORK
		☐ Returned to normal duties ☐ Given alternative work ☐ Unfit for work

19 NAME and ADDRESS of HOSPITAL (if applicable)	20 SPECIFIC LOCATION of ACCIDENT
	☐ Field ☐ Office ☐ Workshop ☐ Laboratory ☐ Other (specify)

21 SEVERITY of INJURY

☐ Near hit or first aid with potential for serious injury

☐ MTA ☐ LTA ☐ Fatality

22 (a) WAS A CHAINSAW INVOLVED in ACCIDENT?

☐ Yes ☐ No

(b) DID ACCIDENT OCCUR DURING FIRE CONTROL?

☐ Yes ☐ No

23 PERSON WAS WORKING

☐ Alone

☐ With other workers

24 SUPERVISION at TIME of ACCIDENT

☐ Directly Supervised

☐ Indirectly Supervised

☐ Direct Supervision not practicable

25 DESCRIBE HOW the ACCIDENT OCCURRED

26 CAUSAL FACTORS. Events and conditions that contributed to the accident. Include those identified by use of the Guide for Identifying Causal Factors and Preventive Actions. i.e. where circles are marked. Remember to indicate guide question no. in this report.

Guide Q.No.	

27 PREVENTIVE ACTIONS. Those that have been, or will be, taken to prevent recurrence. Include those identified by use of the Guide for Identifying Causal Factors and Preventive Actions.

	Responsibility for Preventive Action (see Guide)	Date action to be completed by

28 SIGNATURES: (Do not delay sending this form pending signature of injured person)

Injured Person (if possible).....Date despatched to SOHQ.....

Overseer or Job OIC .....Date despatched to Region.....

Regional/District Safety Officer .....

Regional/District/Branch OIC .....

5. CASE STUDY

CASE STUDY: INJURY ACCIDENT INVOLVING LIGHT PATROL VEHICLE (LPV) AND USE OF LADDER IN NARROW PASSAGE-WAY.

INJURED: A CALM employee with 14 years experience.

ACCIDENT DESCRIPTION: About 9 a.m. on July 14, the employee climbed a 4 metre straight ladder to repair a damaged gutter on a District office building located in a narrow laneway between buildings. The laneway was used by vehicles on rare occasions. After the employee climbed the ladder, he attempted to straighten the gutter. A glance at the gutter revealed he would need a soldering iron. He told his assistant, who had been holding the ladder, to go to the store and get the soldering iron. A moment after the assistant left, and while the employee was in the process of cleaning the gutter, a light patrol vehicle (LPV) loaded with 450l of water, suddenly rounded the corner of the building, into the laneway and struck the ladder, knocking the employee and the ladder to the ground.

INJURIES: Broken arm, fractured ribs, and multiple contusions.

OTHER INFORMATION: The driver of the vehicle claimed he could not stop in time to avoid hitting the ladder because of faulty brakes. A later examination confirmed worn brakes, but no other defect in the braking system. The driver stated he thought he could have stopped in time to avoid hitting the ladder if the brakes had been in good working order. He said he experienced some brake problems earlier in the week, but did not report the problems because he felt they were not serious enough to constitute a hazardous condition. He did, however, know the CALM reporting procedure. Although there were procedures for inspection of light patrol vehicles (LPV) by the workshop, there had been frequent reports of difficult braking on LPV's in the past when they are loaded with water.

The repair of the gutter was a non-recurring task. There was no written job procedure, but the established job procedure was known by the employee and by the supervisor. The supervisor did not discuss or review the potential hazards associated with the job, or the job procedure, with the employees before they started the job. The job procedure did not call for barricades, warning signs, or signals to be placed around the ladder or at the end of the laneway to warn any traffic of the obstruction. Both employees were wearing safety helmets. The supervisor had experienced earlier problems in recognizing or anticipating hazardous conditions during maintenance work.

Case Study

This section shows how to complete the Guide and the Report in an actual accident investigation. The step-by-step explanations show how this accident investigation method identifies causal factors. They also show how this method guides the investigators toward a number of possible preventive actions from which they can select those most likely to satisfy the criteria listed on page 8.

The Case Study on page 13 describes a possible CALM accident. Pages 14 through 21 show how the investigators would use the **Guide for Identifying Causal Factors and Preventive Actions** to analyze the Case Study. A completed Guide for this case is on pages 22 through 31.

The completed Guide yields a list of causal factors and possible preventive actions. To complete the investigation, the investigators would record the causal factors identified in Box 26 of the **Accident Investigation Report.** They would record the preventive actions selected for implementation in Box 27.

Pages 32 and 33 show a completed **Accident Investigation Report** for this accident. Note how carefully the investigators have discriminated between the accident event and the injury event and how many causal factors and corrective actions they have listed.

How to Use the Guide for Identifying Causal Factors and Preventive Actions

The following example shows how the **Guide for Identifying Causal Factors and Corrective Actions** would be used for the Case Study on page 13.

REMINDER: An X in a circle identifies a causal factor. An X in a square indicates that the item is not a causal factor.

PART 1 - EQUIPMENT	
(X) Y ☐ N	1.0 WAS HAZARDOUS EQUIPMENT A CONTRIBUTING FACTOR?
	CAUSAL FACTORS
(X) Y ☐ N	1.1 Did any defect(s) in equipment, tools or material create a hazard?

An equipment hazard existed. The answer to question 1.0 is an X in the YES circle. The LPV's brakes were defective. The answer to question 1.1, an X in the YES circle, identifies a causal factor.

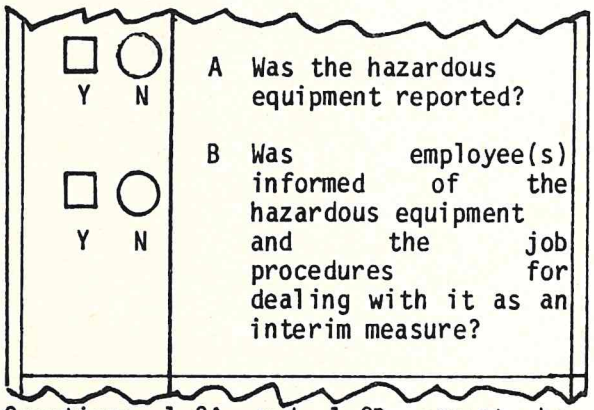
RECOMMENDED PREVENTIVE ACTION: Remove the LPV from service and repair the faulty brakes. To avoid faulty brakes on this and other similar LPVs in the future, review the procedures for inspecting and maintaining brakes on all such LPVs and implement changes to improve these procedures.

☐ Y (X) N	1.2 Was the hazardous equipment recognized?

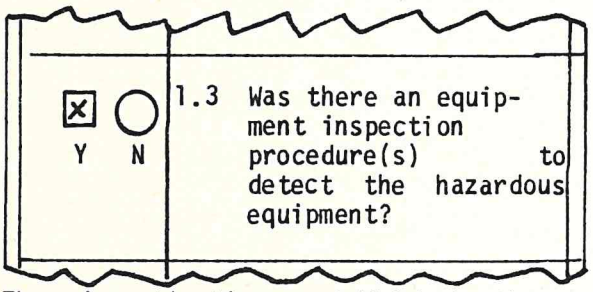
The hazardous equipment was not recognized. The driver did not consider the faulty brakes a hazard. An X in the NO circle identifies another causal factor.

RECOMMENDED PREVENTIVE ACTION: Improve the ability of all drivers to identify defects and hazards with respect to their equipment. Ensure that CALM Fault Report Form is available in all vehicles. Require all drivers to report faulty brakes immediately to workshop.

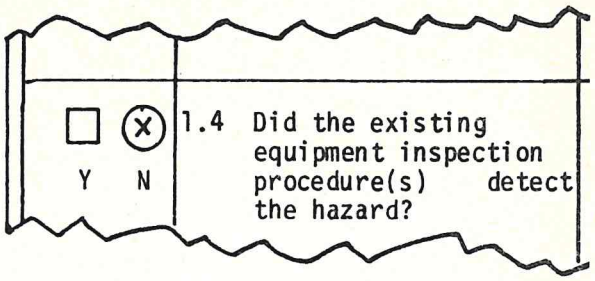
(Note that this preventive action goes beyond the one driver who was involved in the accident. The preventive action is applied to all LPV drivers because other defects on other such LPVs should be identified to avoid future accidents.)



Questions 1.2A and 1.2B cannot be answered because the hazardous condition was not recognized.

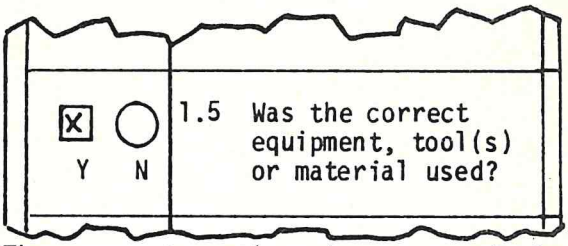


The investigation established there were inspection procedures in effect for LPVs that were carried out by the workshop staff only. The YES square is marked.

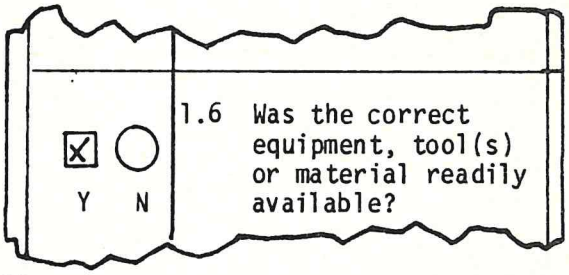


The routine inspection procedures failed to detect faulty brakes on the LPV. Also, the investigation revealed that there had been frequent reports of faulty brake problems on these vehicles in the past. This indicates there may be something wrong with the workshop's existing maintenance procedures for detecting this kind of defect. An X in the NO circle identifies another causal factor.

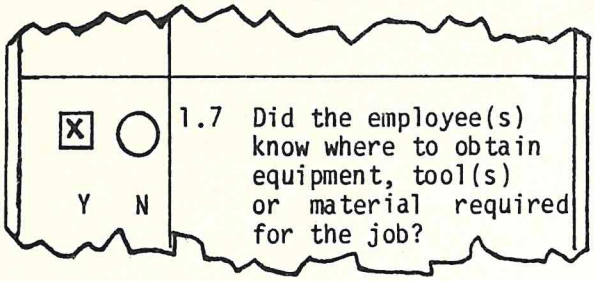
RECOMMENDED PREVENTIVE ACTION: Review the frequency and procedures for inspection and maintenance of brakes by the workshop staff that services LPVs. Implement changes to remove any deficiencies.



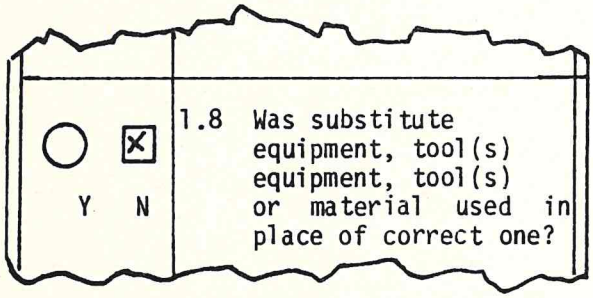
The correct equipment was used for this job. The YES square is marked.



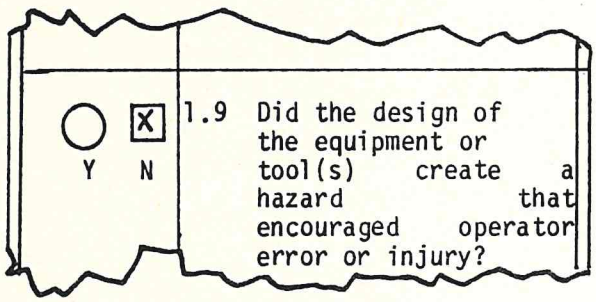
The correct equipment was readily available. The YES square is marked.



Both employees knew where to obtain the equipment and tools necessary to do this job. The YES square is marked.



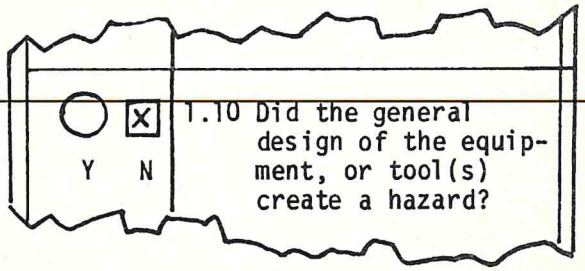
Substitute equipment or tool was not used. The NO square is marked.



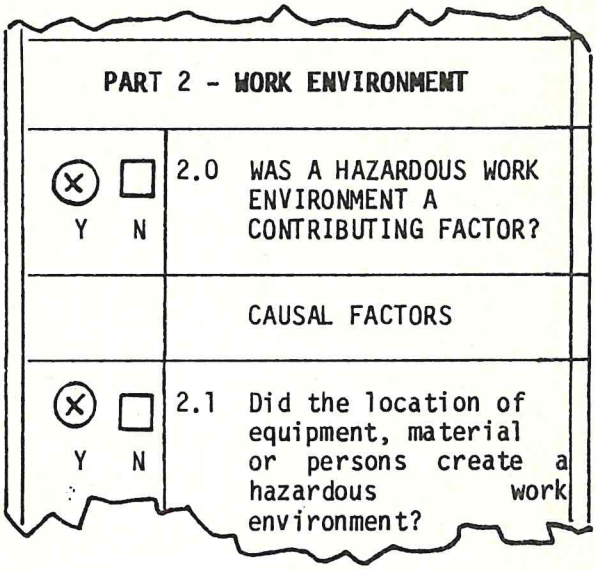
This question should examine if design encouraged operator error. Poor equipment design can encourage an operator error. For example, rotating a water control clockwise will normally cause something to **decrease**. An anticlockwise rotation normally will cause water flow to **increase**. If the design of the equipment required an operator to increase flow by rotating a control clockwise, this would encourage an operator error, especially in an emergency situation.

The investigation should not ignore how the design of equipment might contribute to operator error.

The design of the equipment in this case did not encourage operator error. The NO square is marked.

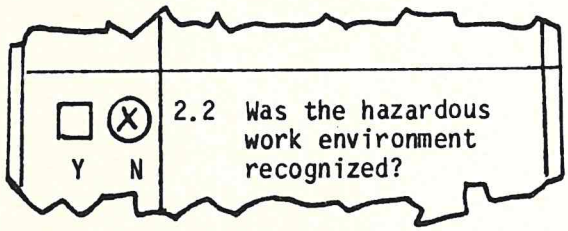


An examination of the braking system revealed only worn brakes, no other defects. Therefore the brake design was not a causal factor. The NO square is marked.



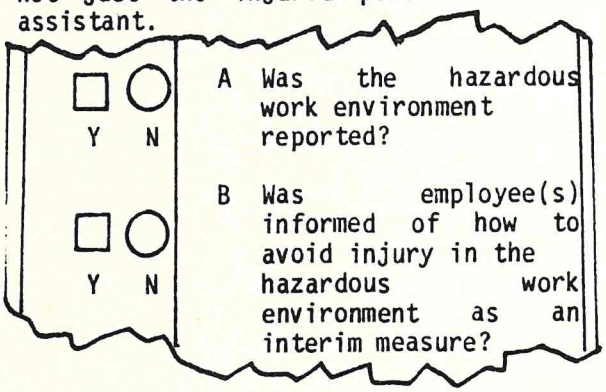
An X in the YES circle for 2.0 shows the ladder's location was a contributing factor. Placing a ladder, without perimenter warnings, in a laneway used by vehicles created a hazard. An X in the YES circle for 2.1 identifies a causal factor.

RECOMMENDED PREVENTIVE ACTION: A review of the job procedures revealed that overhead work performed from ladders and scaffolds did not require perimeter barriers or warnings of any kind. The preventive action is to change the job procedures for all overhead work involving ladders and scaffolds to require barricades, warning lights, or similar devices to protect the work area when there is a possibility of pedestrian or vehicular traffic.

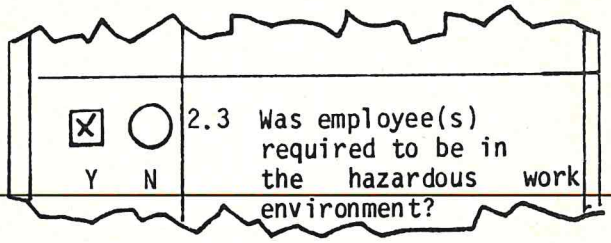


Neither the injured employee nor his assistant realized that a hazardous work environment had been created by placing the ladder in the laneway used by vehicles. The NO circle is marked to identify another causal factor.

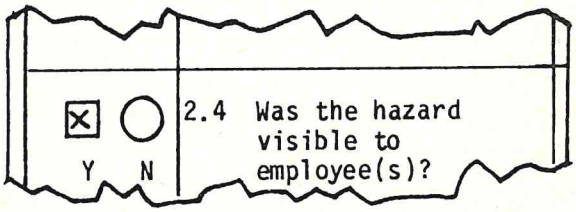
RECOMMENDED PREVENTIVE ACTION: All employees, especially maintenance personnel, should possess some skills that enable them to recognize existing or potential hazardous work environments. The preventive action is to improve the ability of all maintenance employees to recognize existing or potential hazardous work environments created by the location or position of equipment or material. Note that the preventive action applies to all maintenance employees, not just the injured person and his assistant.



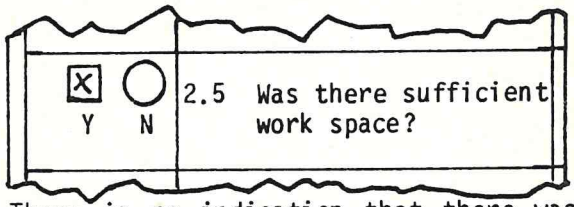
In accordance with the instructions, questions 2.2A and 2.2B cannot be answered because the placement of the ladder was not recognized as one that created a hazardous work environment.



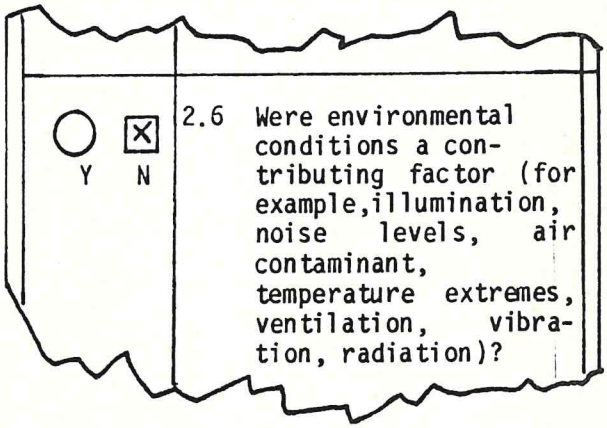
In order to repair the gutter, the injured employee was required to be on a ladder in the laneway where the accident occurred. The YES square is marked.



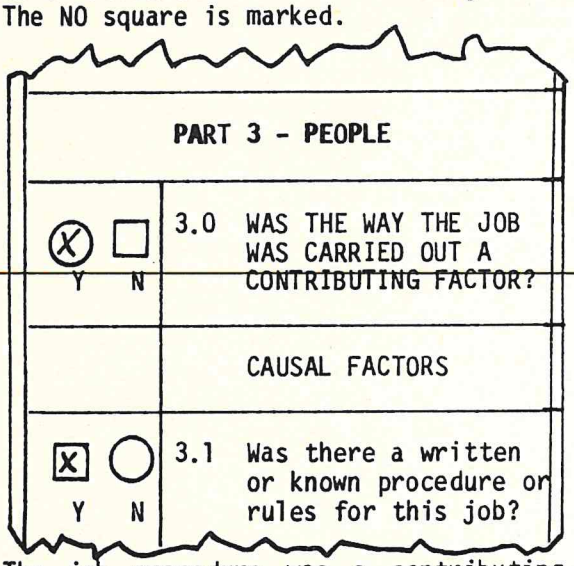
The hazard created by the ladder in the laneway was seen by the driver but, because of faulty brakes, not in time to avoid hitting the ladder. The YES square is marked.



There is no indication that there was insufficient workspace to repair the gutter. The YES square is marked.

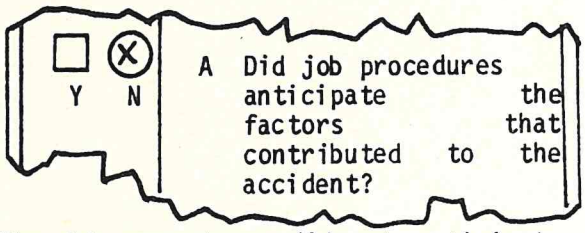


No adverse environmental conditions were revealed in the investigation. The NO square is marked.



		PART 3 - PEOPLE
(X) Y	☐ N	3.0 WAS THE WAY THE JOB WAS CARRIED OUT A CONTRIBUTING FACTOR?
		CAUSAL FACTORS
☒ Y	○ N	3.1 Was there a written or known procedure or rules for this job?

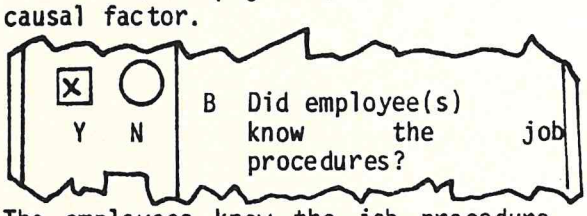
The job procedure was a contributing factor. Investigation showed the supervisor and injured employee knew the procedure for repair of roofs, gutters etc. The YES squares are marked for 3.0 and 3.1.



☐ Y	(X) N A Did job procedures anticipate the factors that contributed to the accident?

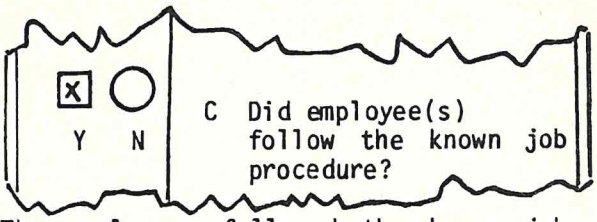
The job procedures did not anticipate vehicular traffic in the laneway where the ladder was placed. The job procedures were deficient. An X in the NO circle identifies another causal factor.

RECOMMENDED PREVENTIVE ACTION: The preventive action recommended for Item 2.1 (see page 17) addresses this causal factor.



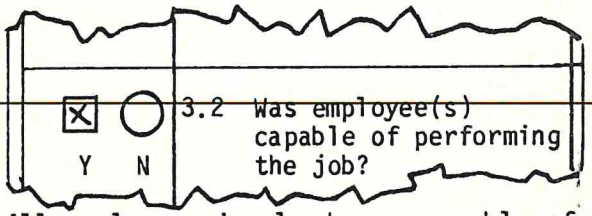
☒ Y	○ N B Did employee(s) know the job procedures?

The employees knew the job procedure, but did not know the procedure was defective. The YES square is marked.



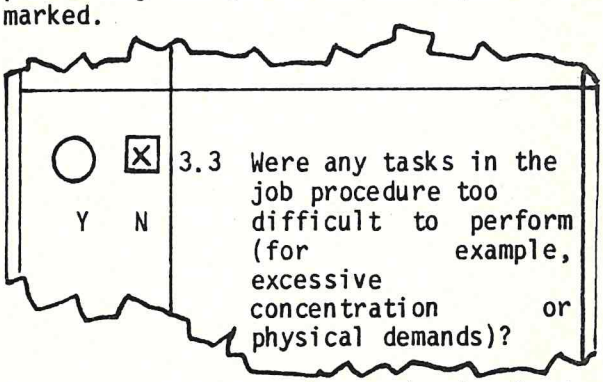
☒ Y	○ N C Did employee(s) follow the known job procedure?

The employees followed the known job procedure. The YES square is marked.



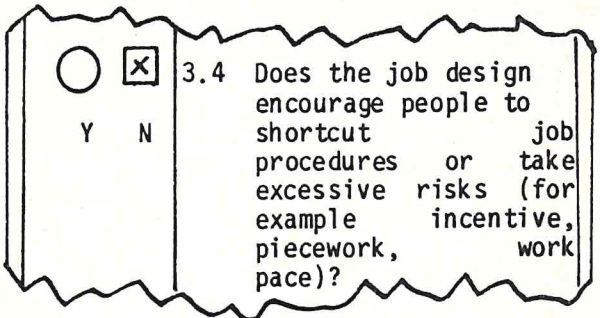
☒ Y	○ N 3.2 Was employee(s) capable of performing the job?

All employees involved were capable of performing the job. The YES square is marked.



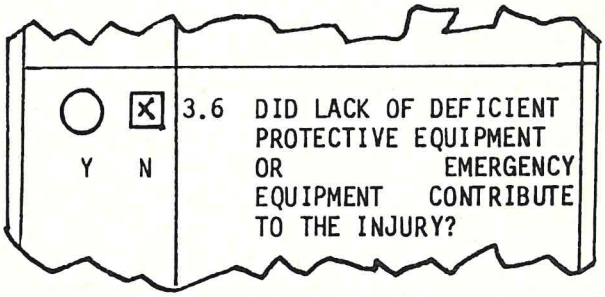
○ Y	☒ N 3.3 Were any tasks in the job procedure too difficult to perform (for example, excessive concentration or physical demands)?

There were no excessive tasks involved in this job. The NO square is marked.



○ Y	☒ N 3.4 Does the job design encourage people to shortcut job procedures or take excessive risks (for example incentive, piecework, work pace)?

The job was not structured to encourage deviation from the job procedures. The NO square is marked.



○ Y	☒ N 3.6 DID LACK OF DEFICIENT PROTECTIVE EQUIPMENT OR EMERGENCY EQUIPMENT CONTRIBUTE TO THE INJURY?

Lack of personal protective equipment or emergency equipment was not a contributing factor in the injury. The NO square is marked.

If the answer were YES, the ten questions in this set would require answers. Since the answer was NO, we go directly to PART 4.

PART 4 - MANAGEMENT	
Y ⊗ N ☐	4.0 WERE DEPARTMENTAL OR LOCAL MANAGEMENT PRACTICES A CONTRIBUTING FACTOR?
	CAUSAL FACTORS
Y ⊗ N ☐	4.1 Could Departmental or local management procedures to detect or report hazards be improved?

A management system defect was a contributing factor. The answer to 4.0 is an X in the YES circle. The supervisor did not anticipate that placing a ladder in this laneway used by vehicles would create a hazardous work environment. An X in the YES circle for 4.1 identifies a causal factor.

RECOMMENDED PREVENTIVE ACTION: Supervisory skills in hazard recognition need to be upgraded. The preventive action recommended is to improve the ability of supervisors to recognize and anticipate hazardous conditions.

Y ○ N ☒	4.2 Could local management procedures to detect or correct deviations from job procedure be improved?

There was no failure to detect or correct deviations from the job procedure. The NO square is marked.

Y ⊗ N ☐	4.3 Was this an infrequently performed task?

If YES, Answer A. If NO, proceed to 4.4

Y ☐ N ⊗	A Did the supervisor review hazards and job procedures with the employee?

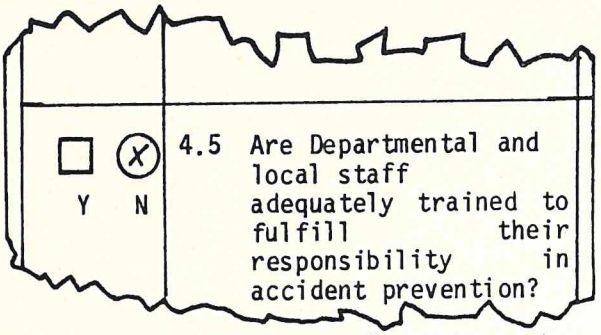
The answer to 4.3 is an X in the YES square.

The supervisor did not review existing or potential hazards or the job procedures with the two employees before they started the repair job. An X in the NO circle identifies another causal factor.

RECOMMENDED PREVENTIVE ACTION: Establish a procedure that requires all supervisors to review hazard potential and job procedures on tasks that are performed infrequently.

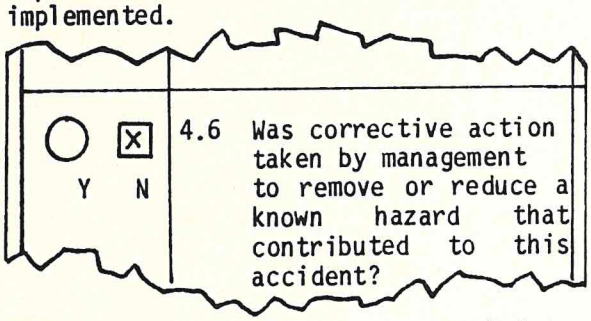
Y ☒ N ○	4.4 Did Departmental and local staff know what was expected of them to prevent this accident?

The investigation established that the supervisor fully understood what was expected of him to prevent this accident. The YES square is marked.



The investigation revealed that the supervisor had previous problems in recognizing or anticipating hazards. This would indicate that his training in this area was inadequate. An X in the NO circle identifies another causal factor.

RECOMMENDED PREVENTIVE ACTION: In addition to the preventive action recommended in Item 4.1, above, there should be a review of the supervisor training program concerning hazard recognition. The changes necessary to improve the training program should be implemented.



There was no failure to initiate corrective action for known hazards that contributed to this accident. The NO square is marked.

The exercise in identifying causal factors and preventive actions, using the Guide for this Case Study is now completed.

The Findings

The process identified nine causal factors that contributed to the accident. These causal factors are recorded in Box 26 of the **Accident Investigation Report.** (See the completed Report for this case on pages 32 to 33.)

This process normally suggests a number of recommended preventive actions. The next task is to select those preventive actions that best fulfull the criteria listed on page 8. With the help of the Guide, many recommended preventive actions were identified - at least one for each causal factor. Based on a hard look at the recommended preventive actions, the actions listed below were selected for implementation. The selection was based primarily on the **effectiveness** of the preventive actions in reducing the probability of a similar accident. Those selected for implementation were:

1. Repair the faulty brakes on the LPV.
2. Improve the ability of all LPV drivers to identify defects and hazards concerning their equipment. Ensure that the CALM Fault Report Form is available in all vehicles. Require drivers to report all defects or hazards to the workshop personnel.
3. Change job procedures for all overhead work involving ladders and scaffolds to require barricades or warning devices to protect the work area from pedestrian or vehicular traffic.
4. Improve the ability of all supervisors to recognize and anticipate hazards.
5. Establish a procedure for supervisors that requires a review of hazards and job procedures (preventive actions) for tasks performed infrequently.

Note that the investigators did not select the preventive action of reviewing the workshop's procedures for inspection and maintenance of LPVs.

This was not considered as effective as preventive action 2, above. Similarly, the investigators did not select the preventive action of reviewing supervisor training in hazard recognition because it was not considered as effective as corrective action 4, above.

The preventive actions selected are recorded in Box 27 of the **Accident Investigation Report.** The investigation report now contains all the essential information needed to identify the causal factors and the selected preventive actions.

IMPORTANT: Implement, as soon as practicable, preventive actions that will eliminate or minimize causal factors that have contributed to a specific accident. **Also implement similar actions elsewhere where similar causal factors may exist.** This approach prevents accidents and changes the management system so that the causal factors already identified are less likely to contribute to a potential accident.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

Answer questions by placing an X
In the "Y" circle or square for YES or
In the "N" circle or square for NO

GUIDE FOR IDENTIFYING CAUSAL FACTORS AND PREVENTIVE ACTIONS

Accident Serial Number TR 7

PART 1 - EQUIPMENT Wherever X is placed in Circle 'Comment' and 'Recommended Preventive Actions' Columns need to be completed					
Y ⊗ N ☐	1.0 WAS HAZARDOUS EQUIPMENT A CONTRIBUTING FACTOR? If yes, answer the following. If no, proceed to Part 2.				
	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
Y ⊗ N ☐	1.1 Did any defect(s) in equipment, tools or material create a hazard?	**Faulty brakes on light patrol vehicle (LPV) Reg No. QYS-222.**	Review existing procedure or prepare new procedure for inspecting, reporting, maintaining, replacing, or recalling defective equipment, tool(s) or material used.	**Repair brakes. Review procedures for LPVs inspection and maintenance.**	**Workshop O.I.C.**
Y ☐ N ⊗	1.2 Was the hazardous equipment recognized? If yes anser A and B. If no proceed to 1.3.	**LPV driver did not consider faulty brakes a hazard.**	Perform job safety analysis. Improve employee ability to recognize existing or potential hazardous conditions. Provide test equipment, as required, to detect hazard. Review any change or modification of equipment, tools(s) or material. Train employees in reporting procedures. Stress individual acceptance of responsibility. Review job procedures for hazard avoidance. Review supervisory responsibility. Improve supervisor-employee communications. Take action to remove or minimize hazard.	**Improve ability of all LPV drivers to identify defects and hazards in their equipment. Ensure that CALM Fault Report Form is available in all vehicles. Require all drivers to report faulty brakes immediately to workshop.**	**District Driving Instructor.**
Y ☐ N ○	A Was the hazardous equipment reported?				**Workshop O.I.C.**
Y ☐ N ○	B Was employee(s) informed of the hazardous equipment and the job procedures for dealing with it as an interim measure?				

	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
☒ Y ○ N	1.3 Was there an equipment inspection procedure(s) to detect the hazardous equipment?		Develop and adopt procedures (for example, an inspection system) to detect hazardous equipment. Conduct test.		
☐ Y ⊗ N	1.4 Did the existing equipment inspection procedure(s) detect the hazard?	**Workshop inspection procedures did not detect faulty brakes on LPV. There were frequent reports of faulty brakes on other LPVs.**	Review procedures. Change frequency or comprehensiveness. Provide test equipment as required. Improve employee ability to detect defects and hazardous equipment. Change job procedures as required.	**Review the frequency and procedures for inspection and maintenance of brakes by the workshop staff that services LPVs. Implement changes to remove deficiencies.**	**Workshop O.I.C.**
☒ Y ○ N	1.5 Was the correct equipment, tool(s) or material used?		Specify correct equipment, tool(s) or material in job procedures.		
☒ Y ○ N	1.6 Was the correct equipment, tool(s) or material readily available?		Provide correct equipment, tool(s) or material. Review purchasing specifications and procedures. Anticipate future requirements. Specify immediate requirements.		
☒ Y ○ N	1.7 Did employee(s) know where to obtain equipment, tool(s) or material required for the job?		Review procedures for storage, access, delivery, or distribution. Review job procedures for obtaining equipment, tool(s) or material.		

	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
○ Y ☒ N	1.8 Was substitute equipment, tool(s) or material used in place of correct one?		Provide correct equipment, tool(s) or material. Warn against use of substitutes in job procedures and in job instruction.		
○ Y ☒ N	1.9 Did the design of the equipment or tool(s) create a hazard that encouraged operator error or injury?		Alter equipment or tool(s) to make it less likely to cause injury. Review purchasing procedures and specifications. Check out new equipment and job procedures involving new equipment before putting into service. encourage employees to report potential hazardous conditions created by equipment design.		
○ Y ☒ N	1.10 Did the general design or quality of the equipment or tool(s) create a hazard?		Review standards or specifications. Recommend changes in equipment to standards association, manufacturer or Branch Manager.		
○	1.11 List other causal factors in "Comment" column.				

PART 2 – WORK ENVIRONMENT	Wherever X is placed in Circle 'Comment' and 'Recommended Preventive Actions' Columns need to be completed

Y	N		CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
		2.0	WAS A HAZARDOUS WORK ENVIRONMENT A CONTRIBUTING FACTOR? If yes, answer the following. If no, proceed to Part 3.				
X		2.1	Did the location of equipment, material or persons create a hazardous work environment.	**Placing ladder in laneway used by forklift created a hazard.**	Perform job safety analysis. Review job procedures. Change the location, position, or layout of the equipment. Change position of persons. Provide guardrails, barricades, barriers, warning lights, signs, or signals.	**Change job procedures for all overhead work involving ladders, scaffolding etc. to require barricades or warning devices to protect the work environment from people or vehicle traffic.**	**District Manager**
	X	2.2	Was the hazardous work environment recognized? If yes, answer A and B. If no, proceed to 2.3.	**Neither the injured employee nor his assistant recognized the hazard.**	Perform job safety analysis. Improve employee ability to recognise existing or potential hazardous work environment. Provide test equipment, as required, to detect hazard. Check if change to the work environment has occurred.	**Improve ability of all maintenance employees to recognise existing or potential hazards created by location or positions of equipment or material.**	**District Manager**
	○	A	Was the hazardous work environment reported?		Train employees in reporting procedures. Stress individual acceptance of responsibility.		
	○	B	Was the employee(s) informed of how to avoid injury in the hazardous work environment, as an interim measure?		Review job procedures for hazard avoidance. Review supervisory responsibility. Take action to remove or minimize hazard or train employees.		

	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
☒ Y ○ N	2.3 Was employee(s) required to be in the hazardous work environment?		Review job procedures and training. Provide guardrails, barricades, barriers, warning lights, signs, or signals.		
☒ Y ○ N	2.4 Was the hazard visible to employee(s)?		Change lighting or layout to increase visibility of work area. Provide guardrails, barricades, barriers, warning lights, signs or signals, floor stripes, etc.		
☒ Y ○ N	2.5 Was there sufficient workspace?		Review workspace requirements and modify as required.		
○ Y ☒ N	2.6 Were environmental conditions a contributing factor (for example, illumination, noise levels, air contaminant, temperature extremes, ventilation, vibration, radiation)?		Check, environmental conditions as required. Check results against acceptable levels. Initiate action for those found unacceptable.		
○	2.7 List other causal factors in "Comment" column.				

PART 3 - PEOPLE	Wherever X is placed in Circle 'Comment' and 'Recommended Preventive Actions' Columns need to be completed			
(X) Y ☐ N	3.0 WAS THE WAY THE JOB WAS CARRIED OUT A CONTRIBUTING FACTOR? If yes, answer the following. If no, proceed to Part 3.6.			
	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
☒ Y ○ N	3.1 Was there a written or known procedure or rules for this job? If yes, answer A,B, and C. If no, proceed to 3.2.		Perform job safety analysis and develop safe job procedures.		
☐ Y (X) N	A Did job procedures anticipate the factors that contributed to the accident?	**Job procedure did not anticipate vehicle traffic.**	Perform job safety analysis and change job procedures.	**See Item 2.1.**	
☒ Y ○ N	B Did employee(s) know the job procedure?		Improve employee training in current job procedures.		
☒ Y ○ N	C Did employee(s) follow the known job procedure?		Determine why. Encourage all employees to report problems with an established procedure. Review job procedure and modify if necessary. Counsel or discipline employee. Provide closer supervision.		
☒ Y ○ N	3.2 Was employee(s) capable of performing the job?		Review employee requirements for the job. Improve employee selection. Transfer employees who are temporarily incapable of performing the job.		

	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
○ ☒ Y N	3.3 Were any tasks in the job procedure too difficult to perform (for example, tasks causing stress, fatique or excessive physical demands)?		Change job design and procedures to minimise stress, fatigue or physical demands.		
○ ☒ Y N	3.4 Does the job design encourage people to shortcut job procedures or take excessive risks (for example, incentive, piecework, work pace)?		Change job design or tighten job procedures.		
○	3.5 List other causal factors in "Comment" column.				
○ ☒ Y N	3.6 **DID LACK OF OR DEFICIENT PROTECTIVE EQUIPMENT OR EMERGENCY EQUIPMENT CONTRIBUTE TO THE INJURY?** If yes, answer the following. If no, proceed to Part 4. Note: The following causal factors relate to the injury.				
	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
☐ ○ Y N	3.7 Was the correct protective equipment specified for the job? If yes, answer A,B, and C. If no, proceed to 3.8.		Review methods of specifying protective equipment requirements.		
☐ ○ Y N	A Was the correct protective equipment available?		Provide appropriate protective equipment. Review purchasing and distribution procedures.		

	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
☐ Y ○ N	B Did employee(s) know that wearing specified protective equipment was required?		Review job procedures. Improve job instruction by supervisor and training of employees.		
☐ Y ○ N	C Did employee(s) know how to use and maintain the protective equipment?		Improve job instruction by supervisor and training of employees.		
☐ Y ○ N	3.8 Was any protective equipment used when the injury occurred?		Determine why and take appropriate action. Implement procedures to check and enforce use of protective equipment.		
☐ Y ○ N	3.9 Was the Protective Equipment used adequate to prevent injury?		Review protective equipment standards or specifications. Recommend changes in equipment to standards association, manufacturer or branch manager.		
☐ Y ○ N	3.10 Was emergency equipment specified for this job (for example, breathing aparatus or eyewash fountains)? If yes, answer the following. If no, proceed to Part 4.		Specify emergency equipment as required.		
☐ Y ○ N	A Was emergency equipment readily available?		Provide emergency equipment at appropriate locations.		
☐ Y ○ N	B Was emergency equipment properly used?		Incorporate correct use of emergency equipment in job procedures.		
☐ Y ○ N	C Did emergency equipment function properly?		Establish regular checking system for emergency equipment. Provide for immediate repair of defects.		
○	3.11 List other causal factors in "Comment" column.				

PART 4 – MANAGEMENT Wherever X is placed in Circle 'Comment' and 'Recommended Preventive Actions' Columns need to be completed

Y	N		CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
(X)	☐	4.0	WERE DEPARTMENTAL OR LOCAL MANAGEMENT PRACTICES A CONTRIBUTING FACTOR? If yes, answer the following. If no, STOP. Your causal factor indentification erercise is complete.				
(X)	☐	4.1	Could Departmental or Local management procedures to detect or report hazards be improved?	**Yes. Supervisor did not anticipate that placing ladder in laneway used by vehicles would create a hazard.**	Review procedures for identifying reporting and correcting hazards.	**Improve ability of all supervisors to recognise and anticipate hazards.**	**District Manager**
◯	☒	4.2	Could local management procedures to detect or correct deviations from job procedure be improved?		Review job safety analysis and job procedures. Improve supervision to correct deviations from job procedures.		
(X)	☐	4.3	Was this an infrequently performed task? If yes answer A. If no proceed to 4.4.	**Yes.**	Establish procedures that require a review of hazards, job procedures and preventive actions for tasks performed infrequently.	**Establish a procedure that requires all supervisors to review hazards and job procedures with employees for jobs that are performed infrequently.**	**District Manager**
☐	(X)	A	Did the supervisor review hazards and job procedures with the employee?	**Supervisor did not review hazards or job procedures with either employee.**			
☒	◯	4.4	Did Departmental or local staff know what was expected of them to prevent this accident?		Define responsibility and accountability for Departmental and local staff in accident prevention. Test if it is understood and accepted.		

	CAUSAL FACTORS	COMMENT	POSSIBLE PREVENTIVE ACTIONS	RECOMMENDED PREVENTIVE ACTIONS	Personal (name) Local Management or Departmental Responsibility
☐ (X) Y N	4.5 Are Departmental and local staff adequately trained to fulfill their responsibility in accident prevention?	Training inadequate in recognition or antiicpation of hazards.	Train staff in accident prevention. specify type of training needed.	See 4.3 above. Review supervisor training in hazard recognition. Implement changes to improve training.	District Manager
◯ ☒ Y N	4.6 Was preventive action taken by management to remove or reduce a known hazard that contributed to this accident?		Review and improve procedures to initiate and carry out corrective actions. Monitor progress of corrective actions.		
◯	4.7 List other causal factors in "Comment" column.				

CLM 6

DEPARTMENT OF CONSERVATION & LAND MANAGEMENT

PERSONAL INJURY ACCIDENT INVESTIGATION REPORT

ACCIDENT SERIAL NO. TR 7

(Complete the Guide for Identifying Causal Factors and Preventive Actions before completing this form. Please send this form to SOHG within 10 days)

REGION WESTERN BRANCH RESEARCH

DISTRICT TREESVILLE

1 NAME of INJURED	2 SEX	3 AGE
Smith, John	M [X] F [ ]	[ ] Under 20 [X] 30-39 [ ] 50-59 [ ] 20-29 [ ] 40-49 [ ] Over 59

4 (a) DATE of ACCIDENT	5 PERSONS USUAL OCCUPATION	6 TASK at TIME of ACCIDENT	7 EXPERIENCE in TASK at TIME of ACCIDENT
14/7/86	Carpenter	(also see 7) Same	[ ] None [ ] Average [ ] A little [X] Very Experienced
(b) DATE ACCIDENT REPORTED 14/7/86			

8 EMPLOYMENT CATEGORY	9 LENGTH of EMPLOYMENT	10 PIECEWORKER
[X] Full Time [ ] Unemployment Relief	[ ] Less than 3mo [ ] 3 mos to 1 yr	Yes [ ] No [X]
[ ] Part-time [ ] Seasonal	[ ] 1-5 years [X] More than 5yrs	

11 PART of BODY INJURED (Tick one box only)

Head	[ ] 01	Arm	[ ] 04	Trunk/back	[ ] 08
Eyes	[ ] 02	Hand	[ ] 05	Trunk/other	[ ] 09
Neck	[ ] 03	Leg	[ ] 06	Multiple	[X] 10
		Foot	[ ] 07	Other	[ ] 11

12 NATURE of INJURY (Tick one box only)

Fracture	[ ] 01	Amputation	[ ] 05	Shock, Heart Attack	[ ] 10
Dislocation	[ ] 02	Laceration, other open wound	[ ] 06	Bite (snake, insect, animal)	[ ] 11
Sprain, strain	[ ] 03	Contusion, crushing	[ ] 07	Multiple	[X] 12
Concussion, other internal	[ ] 04	Burn, scald	[ ] 08	Other	[ ] 13
		Inhalation of gas	[ ] 09	Harmful Contacts	[ ] 14

13 NAMES of OTHERS INJURED in SAME ACCIDENT (if any)	14 TIME of ACCIDENT	15 DAY of WEEK
None	9.00 AM PM	Monday
CALM Employee(s) [X] Yes [ ] No (please tick)		

16 NAME and ADDRESS of DOCTOR or NURSE (if applicable)	17 DATE FIRST ATTENDED	18 RETURN TO WORK
Dr Henry Carter 5 Park Avenue, Treesville		[ ] Returned to normal duties [ ] Given alternative work [X] Unfit for work

19 NAME and ADDRESS of HOSPITAL (if applicable)	20 SPECIFIC LOCATION of ACCIDENT
General Hospital First Ave & State St, Treesville	[ ] Field [ ] Office [ ] Workshop [ ] Laboratory [X] Other (specify) - Between District Office Building and Store.

21 SEVERITY of INJURY

Near hit or first aid with potential for serious injury

☐ MTA ☒ LTA ☐ Fatality

22 (a) WAS A CHAINSAW INVOLVED in ACCIDENT?

☐ Yes ☒ No

(b) DID ACCIDENT OCCUR DURING FIRE CONTROL?

☐ Yes ☒ No

23 PERSON WAS WORKING

☒ Alone

☐ With other workers

24 SUPERVISION at TIME of ACCIDENT

☐ Directly Supervised

☐ Indirectly Supervised

☒ Direct Supervision not practicable

25 DESCRIBE HOW the ACCIDENT OCCURRED

Smith climbed 4 metres straight ladder to repair gutter. While inspecting gutter, Smith sent his assistant, Green, who was holding the ladder, to get a soldering iron. After Green left, and while Smith continued cleaning the gutter, Jones, driving a LPV that had faulty brakes, approached and struck the ladder, knocking both the ladder and Smith to the ground.

26 CAUSAL FACTORS. Events and conditions that contributed to the accident. Include those identified by use of the Guide for Identifying Causal Factors and Preventive Actions. i.e. where circles are marked. Remember to indicate guide question no. in this report.

Guide Q.No.	
1.1	*Faulty brakes on LPV QVS-222.*
1.2	*LPV driver did not consider faulty brakes a hazardous condition.*
1.4	*Workshop inspection procedures failed to detect faulty brakes.*
2.1	*Placing ladder in laneway used by vehicles created a hazardous condition.*
2.2	*Neither Smith nor Green, his assistant, recognized the hazardous condition.*
3.1 A	*Job procedure did not anticipate vehicular traffic.*
4.1	*Supervisor did not anticipate placement of ladder in laneway used by vehicles would create a hazardous condition.*
4.3 A	*Supervisor did not review potential hazards or job procedures with either employee before they started the job.*
4.5	*Supervisor's training was inadequate in recognition or anticipation of hazardous conditions.*

27 PREVENTIVE ACTIONS. Those that have been, or will be, taken to prevent recurrence. Include those identified by use of the Guide for Identifying Causal Factors and Preventive Actions.

	Responsibility for Preventive Action (see Guide)	Date action to be completed by
1. *Repair brakes.*	*OIC Workshop*	*18.7.86*
2. *Improve ability of all LPV drivers to detect defects and hazardous conditions in their equipment. Ensure that CALM Fault Report Form is available in all vehicles. Require all drivers to report faulty brakes immediately to workshop.*	*H. Green*	*25.7.86*
3. *Change job procedures for all overhead work involving ladders and scaffolds to require barricades or warning devices to protect the area from pedestrian or vehicular traffic.*	*H. Green*	*25.7.86*
4. *Improve ability of all supervisors to recognise and anticipate hazardous conditions.*	*R. Blue*	*Ongoing*
5. *Establish a procedure for all supervisors that requires a review of hazards and job procedures (preventive action) for tasks performed infrequently.*	*R. Blue*	*29.8.86*

28 SIGNATURES: (Do not delay sending this form pending signature of injured person)

Injured Person (if possible) ..*J. Smith*..... Date despatched to SOHQ ...*17.7.86*.....

Overseer or Job OIC .....*P. Brown*..... Date despatched to Region.*17.7.86*.....

Regional/District Safety Officer ..*H. Green*.....

Regional/District/Branch OIC ...*A. White*.....

6. SUMMARY OF CAUSAL FACTORS

The purpose of summarizing causal factors is to identify those that have contributed most frequently to a group of accidents being analyzed. When causal factors are found repeatedly in a number of accident investigations, they generally reveal patterns that suggest changes in the management system or in the safety and health program. Repeated analyses over months or years will show long-term trends. These also can be used to evaluate the impact of changes in the management system and the impact of corrective actions taken.

The form, **Summary of Causal Factors** (pages 37 to 39), suggests a way to summarize causal factors. This form is the third key document presented in this manual. Each statement in the Summary corresponds to a question in the **Guide for Identifying Causal Factors and Preventive Actions.** The six columns of squares next to the statements are provided for tallies of the frequency of occurrence of the causal factors. Essentially a tabulation form, the Guide facilitates the tallying of causal factors by whatever general category and subcategories the analyst selects.

A two-step procedure can help identify causal factors in a given category. First the general category and subcategories are selected, and then the number of cases is recorded on the Summary. Safety personnel usually carry out this kind of analysis.

Selecting Categories

There are many different categories that can be selected for analysis. For example, an entire organisation or development can be treated as a single category. The analysis would then tell management which causal factors were identified most frequently in the accident cases that occurred throughout the organisation in a given period. This information, in turn, could suggest priorities for general changes in the management system to improve the overall safety and health performance.

It is often useful to analyze the causal factors for subcategories within a general category. For example, if the entire organisation is the general category, then departments or occupations could be the subcategories. Or if the occupation "machine operator" is the general category, then the various amounts of time in the occupation could be the subcategories. If total accidents in a specific department is the general category, subcategories can deal with such factors as occupation or job category, age of worker, number of injuries, or parts of body injured.

Many of the items included in the **Accident Investigation Report** form can be selected as categories for analysis. The general category selected should be written on the Summary form on the line provided, and all of the cases that fall into this category should be tallied in the column labelled "Category Total". If subcategories are used, they should be entered in the other columns. (Add more columns if necessary.) Cases that fall into the general category should be tallied in the "Category Total" column just as before, but the cases that also fall into one of the subcategories also should be tallied again in the appropriate subcategory column.

One advantage of the Summary is its flexibility. The analyst is encouraged to select any general category and any set of subcategories - they will all be related to causal factors.

Pages 37 to 39 illustrate a completed Summary. The general category in the illustration is the entire company and the subcategories are the departments within the company.

Creating the Summary

Once the general category and subcategories have been selected, it is a simple task to tally the causal factors identified in the Guide for each case that falls within the selected category. (Remember, an X in a circle indicates a causal factor whether the response is YES or NO.) The totals in each square in the Summary indicate the number of accident cases in which the causal factor was found. They should not be added, since there is usually more than one causal factor identified in each accident.

These summaries reveal which causal factors are commonly associated within a category of cases and how causal factors vary from one category to another. This information can suggest priorities for specific changes in the management system or in the safety and health program.

Using the Summary

The completed **Summary of Causal Factors** shown on pages 37 to 39 summarizes 28 accident cases. In this example, the entire company was selected as the general category, and its three departments were selected as the subcategories.

The Summary for the company in the "Category Total" column highlights the following:

- Hazardous equipment was a contributing factor in 26 of the 28 cases.
  In 21 of these cases, there was a defect in the equipment or tools or materials.
  In 17 of these cases, the hazards were not recognized. (This could account for the high number of defects.)
  In 13 of these cases, the existing equipment inspection procedures did not detect the hazards. (This could account for the high number of cases in which the hazardous condition was not recognized.)

- The way the job was carried out was a contributing factor in 25 of the 28 cases.
  In 13 of these cases, a job procedure existed, but did not anticipate the factors contributing to the accident.

- A management system defect was a contributing factor in 25 of the 28 cases.
  In 21 of these cases, Department or Local Management failed to detect, anticipate, or report a hazardous condition.
  In 15 of these cases, Department or Local Staff did not know what was expected of them to prevent accidents.
  In 18 of these cases, Department or Local Staff were not adequately trained to fulfill the assigned responsibility in accident prevention.

Taking Preventive Action

The findings in the completed **Summary of Causal Factors** suggest that management should implement the following changes to improve the organisations overall safety and health performance.

1. Improve employee skills in recognizing existing or potential hazards. Focus on hazards brought about by any changes or modifications, intended or unintended, that may have occurred in equipment, tools, or materials.

2. Upgrade existing equipment inspection procedures to detect defects or hazards. Consider increasing the frequency or comprehensiveness of the inspections.

3. Review existing Job Safety Analysis (JSA) to determine additional potential causal factors. Perform JSA on other jobs that are performed on a regular basis. Change job procedures as indicated by the JSA. Provide job instruction training based on the new job procedures.

4. Provide management and supervisory training to enable the supervisors to carry out their accident prevention responsibilities. The training should:

   - Emphasize the manager's and supervisors' role in accident prevention
   - Increase the manager's and supervisors' skills in detecting and anticipating hazards
   - Specifically define the manager's and supervisors' responsibility and accountability.

The implementation of the four recommended preventive actions derived from the Summary can contribute significantly to improvement in the overall safety and health performance for the entire organisation. The Summary indicates that implementation of the preventive actions should zero in on Department A, where most of the problems are apparent. A summary of the causal factors by occupation or job classification will help to establish priorities and further pinpoint where the preventive action should be implemented.

Much can be learned by looking at the causal factors that contributed to a single accident. Even more can be learned by looking at groups of accidents. The procedures suggested in this text enable the analyst to do both.

SUMMARY OF CAUSAL FACTORS

General Category CALM
Dates of Cases: From Jan 1, 1986 to Dec 31, 1986

Subcategories Loct.A	Loct.B	Loct.C	Cat.Total			Subcategories Loct.A	Loct.B	Loct.C	Cat.Total
17	8	3	28	NUMBER of CASES					
16	7	3	26	1.0	**HAZARDOUS EQUIPMENT A CONTRIBUTING FACTOR.**				
12	6	3	21	1.1	Defects(s) in equipment, tool(s) or material create a hazard.				
10	4	3	17	1.2	Hazardous equipment not recognized.				
2	2	0	4	A	Hazardous equipment recognized, but not reported.				
4	1	0	5	B	Hazardous equipment reported, but employee(s) not informed of known hazard and job procedures for dealing with it as an interim measure.				
2	1	1	4	1.3	Lack of equipment inspection procedure(s) to detect hazards.				
8	3	2	13	1.4	Existing equipment inspection procedure(s) did not detect hazards.				
2	1	0	3	1.5	Correct equipment, tool(s) or material not used.				
0	0	0	0	1.6	Correct equipment, tool(s) or material not readily available.				
0	0	0	0	1.7	Employee(s) did not know where to obtain equipment, tool(s) or material required for the job.				
2	1	0	3	1.8	Substitute equipment, tool(s) or material used in place of proper one.				
				1.9	Equipment, tool(s) design created a hazard that encouraged operator error	0	0	0	0
				1.10	General design or quality of equipment, tool(s) contributed to hazards.	0	0	0	0
				1.11	Other causal factors.	0	0	0	0
				2.0	**A HAZARDOUS WORK ENVIRONMENT A CONTRIBUTING FACTOR.**	2	4	0	6
				2.1	Location, position of equipment, material or employee(s) contributed to hazards.	2	4	0	6
				2.2	Hazardous work environment not recognized.	2	2	0	4
				A	Hazardous work environment recognized, but not reported.	0	0	0	0
				B	Hazardous work environment reported, but employee(s) not informed of how to avoid injury in the hazardous environment as an interim action.	0	2	0	2
				2.3	Employee(s) should not have been in vicinity of hazardous work environment.	1	2	0	3
				2.4	Hazards not seen by employee(s).	0	0	0	0
				2.5	Workspace insufficient.	0	1	0	1
				2.6	Environmental condition(s) a contributing factor.	0	0	0	0
				2.7	Other causal factors.	0	0	0	0

Subcategories						Subcategories			
Loct.A	Loct.B	Loct.C	Cat.Total			Loct.A	Loct.B	Loct.C	Cat.Total
15	7	3	25	**3.0**	**WAY JOB WAS CARRIED OUT WAS A CONTRIBUTING FACTOR.**				
4	1	0	5	3.1	No written or known job procedures.				
9	2	2	13	A	Job procedures existed, but did not anticipate factors contributing to accident.				
0	3	1	4	B	Job procedures existed, but employee(s) did not know them.				
2	1	0	3	C	Employee(s) knew job procedures, but did not follow them.				
0	0	0	0	3.2	Employee(s) not capable of performing job.				
0	0	1	1	3.3	Task in job procedures too difficult to perform.				
2	0	0	2	3.4	Job structured to encourage short cut from job procedures.				
0	0	0	0	3.5	Other causal factors.				
4	1	0	5	**3.6**	**DID LACK of or DEFICIENT PERSONAL PROTECTIVE EQUIPMENT or EMERGENCY EQUIPMENT CONTRIBUTE TO THE INJURY.**				
2	0	0	2	3.7	Appropriate personal protective equipment (PPE) not specified.				
				A	PPE specified, but not available.				
				B	PPE specified, but employee(s) did not know PPE was required.				
				C	PPE specified, but employee(s) did not know how to use or maintain PPE.	2	0	0	2
				3.8	PPE not used.	0	0	0	0
				3.9	PPE used was inadequate.	0	0	0	0
				3.10	Emergency equipment not specified for this job.	0	0	0	0
				A	Emergency equipment specified, but not readily available.	0	0	0	0
				B	Emergency equipment specified, but was not used properly.	0	0	0	0
				C	Emergency equipment specified, but did not function properly.	0	0	0	0
				3.11	Other causal factors.	0	0	0	0
14	8	3	25	**4.0**	**DEPARTMENT OR LOCAL MANAGEMENT PRACTICES A CONTRIBUTING FACTOR.**				
12	6	3	21	4.1	Department or Local Management procedures to detect or report hazards inadequate.				
2	1	0	3	4.2	Local Management procedures to detect or correct deviations from job procedures inadequate.				
3	0	0	3	4.3	Infrequently performed task.				
3	0	0	3	A	Failure to conduct supervisor/employee review of hazards and job procedures for tasks performed on infrequent basis.				

Subcategories			
Loct.A	Loct.B	Loct.C	Cat.Total
10	4	1	15
12	4	2	18
4	1	0	5
0	0	0	0

4.4 Department or Local Staff did not know what was expected of them to prevent accident.

4.5 Department or Local Staff not adequately trained to fulfill assigned responsibility in accident prevention.

4.6 Failure to take preventive action on known hazards.

4.7 Other causal factors.