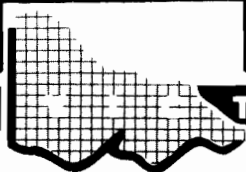


**VICTORIAN
AUDITOR-GENERAL'S
OFFICE**



A U D I T V I C T O R I A

Special Report No. 16

■ Fire Protection

April 1992

"AUDITING IN THE PUBLIC INTEREST"



VICTORIA

Auditor-General
of Victoria

SPECIAL REPORT No. 16

FIRE PROTECTION

Ordered by the Legislative Assembly to be printed

MELBOURNE
L.V. NORTH, GOVERNMENT PRINTER
1992

ISSN 0818-5565
ISBN 0 7306 2702 0



April 1992

The Honourable the Speaker
Legislative Assembly
Parliament House
Melbourne, Vic. 3002

Sir

Under the provisions of section 48A of the *Audit Act* 1958, I transmit a Special Report on Fire Protection.

Yours faithfully


C.A. BARAGWANATH
Auditor-General

PREVIOUS SPECIAL REPORTS OF THE AUDITOR - GENERAL

<i>Report No.</i>	<i>Title</i>	<i>Date issued</i>
1	• Works Contracts Overview - First Report	June 1982
2	• Works Contracts Overview - Second Report	June 1983
3	• Government Stores Operations • Department Cash Management	October 1984
4	• Court Closures in Victoria	November 1986
5	• Provision of Housing to Government Employees • Post-Project Appraisal Procedures within the Public Works Department	December 1986
6	• Internal Audit in the Victorian Public Sector	December 1986
7	• Motor Vehicles	April 1987
8	• Foreign Exchange	November 1987
9	• Land Utilisation	November 1987
10	• Utilisation of Plant and Equipment • Youth Guarantee	November 1988
11	• Financial Assistance to Industry	March 1989
12	• Alfred Hospital	May 1990
13	• State Bank Group - Impact on the financial position of the State	May 1990
14	• Accommodation Management	October 1990
15	• Met Ticket	November 1990

CONTENTS

PART 1	EXECUTIVE SUMMARY	1
	1.1 FOREWORD	3
	1.2 SUMMARY OF MAJOR AUDIT FINDINGS	5
PART 2	AUDIT REVIEW	15
	2.1 AUDIT OBJECTIVE AND SCOPE	17
	2.2 BACKGROUND TO FIRE PROTECTION	19
PART 3	FIRE PREVENTION	21
PART 4	FIRE SUPPRESSION	47
PART 5	COMMUNICATIONS NETWORK FOR FIREFIGHTING PURPOSES	57
PART 6	SCOPE FOR SHARING FIREFIGHTING RESOURCES	61
PART 7	FIRES INFORMATION RESOURCES AND EQUIPMENT SYSTEM (FIRES)	65

PART 1

EXECUTIVE SUMMARY

1.1**FOREWORD**

1.1.1 In recent years, health, safety and environmental issues have featured prominently in performance audit reviews undertaken by my Office. This Report continues that theme with an examination of the management of fire prevention and fire suppression in the State's forests, national parks and other protected public land.

1.1.2 Responsibility for the management of fire prevention and suppression within the State's protected areas rests with the Department of Conservation and Environment. There is little doubt in my mind that this facet of the Department's activities must rank as one of the most important responsibilities of government.

1.1.3 The costs of fire in terms of loss of human life and destruction of natural and other assets cannot, of course, be accurately measured. The absolute importance of effective fire protection within Victoria is reinforced by the fact that the State is widely recognised as one of the most fire hazardous areas in the world. This situation poses a real dilemma to government decision-makers in determining the level of financial resources which are necessary, over time, to contain the State's fire risk to acceptable levels.

1.1.4 The Report explores a range of issues including:

- ▶ the quality of the Department's strategic management of fire protection;
- ▶ the appropriateness of current funding arrangements; and
- ▶ the extent to which Parliament and the community are adequately informed of the risk of damage by fire in the protected areas of the State.

1.1.5 I hope that the important issues canvassed in this review and the major audit findings documented in the Executive Summary will be of interest and assistance to all parliamentarians, the Government, the Department of Conservation and Environment, and the public of Victoria.

1.2

SUMMARY OF MAJOR AUDIT FINDINGS

KEY FINDINGS

- ▶ Management of fire prevention and fire suppression in State forests, national parks and other protected public lands is one of the most important responsibilities of government. The Department of Conservation and Environment's fire management personnel recognise this position and have pursued their responsibility in a conscientious and dedicated manner.
- ▶ Weaknesses were found to exist in the Department's strategic management processes, particularly in relation to fire prevention. As a consequence, audit found that the Department is not in a position to determine, with any confidence, the overall risk of fire to human life and valuable State assets. In addition, shortcomings in key elements of the Department's fire prevention program raise serious concerns about the State's firefighting capability in particular areas of the State.
- ▶ Specifically, audit found that:
 - many of the State's important fire access tracks, which are vital to effective fire protection, were in a very poor condition;
 - under-achievement of planned fuel reduction burning, with a concentration in lower priority zones, has resulted in levels of forest undergrowth and debris up to 7 times greater than departmental targets, particularly in high risk zones;
 - around 31 per cent of the Department's firefighting equipment was obsolete and required replacement at an estimated cost of \$4.5 million; and
 - there was a lack of central analysis of information for important aspects of fire prevention and suppression to assist the Department in strategic decision-making.

KEY FINDINGS - *continued*

- ▶ A common thread underpinning the previously mentioned problem areas was the use of ad hoc approaches for determining periodic funding arrangements for fire prevention. Funding decisions have been influenced more by global levels of funds made available through the annual budget process for all departmental purposes rather than on the basis of structured assessments of the State's fire risk.
- ▶ Urgent attention is necessary to ensure that the funds provided for fire prevention activities are clearly identified in the Department's annual appropriation for the perusal of the Parliament and subsequently the public, as is done in the funding of fire suppression activities.
- ▶ The Department recognises the majority of the shortcomings identified by audit and has commenced to address a number of issues. It is currently in the early stages of arranging a major risk-based consultancy review of all fire protection activities within the State.

Specific findings arising from the audit review are summarised in the following pages of this Executive Summary.

FIRE PREVENTION

Page 21

- ▶ Only 8 of the Department's 16 regions had finalised long-term plans for fire prevention, even though 7 years had elapsed since commencement of preparation of the plans.

Para. 3.1.6

- ▶ Because of deficiencies in the Department's strategic management procedures, it has not been in a position to assess:
 - the overall risk to the State's protected areas of destruction or damage by fire; and
 - whether the annual allocation of funds across regions for fire prevention reduces the State's fire risk to the maximum degree.

Paras 3.1.6 and 3.1.8

- ▶ In 1991-92, a 12 per cent across-the-board cut to departmental budget allocations led to a reduction of \$750 000 in funds available for fire prevention.

Para. 3.1.14

- ▶ In real terms, the level of expenditure by the Department for fire prevention has fallen by 23 per cent over the past 5 years.

Para. 3.1.16

- ▶ Fire prevention is far too important an issue for funding decisions to be influenced by priorities placed on other activities.

Para. 3.1.19

- ▶ Parliament and the public should be provided with specific information each year on the level of funds allocated within the State for fire prevention in the State's protected areas.

Para. 3.1.20

- ▶ Despite the importance of fire access tracks to effective prevention and control of fires, many critically-placed tracks were:

- in extremely poor condition and would not be effective in the event of fire;
- in such a serious state of disrepair that the Department had been forced to close-off access to its own staff and the bushwalking public for safety reasons; and
- overgrown with grasses, bushes and other combustible materials which substantially nullified their effectiveness as firebreaks.

Para. 3.1.27

FIRE PREVENTION - *continued*

Page 21

- ▶ The Department is unable to determine the overall fire risk to the State's protected areas in terms of the accumulation of undergrowth and debris.
Para. 3.1.39
- ▶ Planned levels of controlled burning by the Department have not been achieved during the past 3 years.
Para. 3.1.42
- ▶ The pattern of controlled burning was directly contrary to the Department's priority ranking with those areas warranting the highest level of protection to human life, property and public assets actually receiving the lowest level of protection.
Para. 3.1.44
- ▶ In the majority of regions, the levels of forest fuels were higher than target levels set by the Department, with some cases up to 7 times higher.
Paras 3.1.49 and 3.1.50
- ▶ The Department's firefighting equipment across the State is in poor condition, with approximately 31 per cent of equipment in need of replacement at a cost of around \$4.5 million.
Para. 3.1.63

FIRE SUPPRESSION

Page 47

- ▶ In 3 of the 4 regions examined by audit, response times (time elapsed between notification of fire and dispatch of crew) were higher than an internationally-used performance standard of 15 minutes.
Para. 4.1.18
- ▶ Although post-fire debriefings have been a useful method for identifying and documenting problems encountered in combating bush fires, there was little evidence of resultant remedial action taken by the Department.
Para. 4.1.28

**COMMUNICATIONS NETWORK FOR
FIREFIGHTING PURPOSES***Page 57*

- ▶ Problems with existing communication facilities have been tackled primarily on a regional rather than on a State-wide basis with management in individual regions pursuing the upgrading of communications in line with locally-assessed funding priorities.

Para. 5.1.6

- ▶ There is uncertainty within the Department on the most appropriate communications strategy to pursue in the short to medium-term.

*Para. 5.1.6***SCOPE FOR SHARING FIREFIGHTING RESOURCES***Page 61*

- ▶ Opportunities exist for achieving greater levels of efficiency and effectiveness in the management of the State's firefighting resources through more formalised resource-sharing arrangements between the Department and the Country Fire Authority.

*Para. 6.1.5***FIRES INFORMATION RESOURCES AND
EQUIPMENT SYSTEM (FIRES)***Page 65*

- ▶ The development and implementation of the FIRES computer system has been a major achievement by the Department for which it should be commended. The Department now needs to ensure that the system is efficiently and effectively used as a fire management tool.

Para. 7.1.8

- ▶ The Department should review its decision not to fully comply with the national standard, as set by the Standards Association of Australia, for the recording of information relating to fires.

Para. 7.1.12

PART 2

AUDIT REVIEW

2.1**AUDIT OBJECTIVE AND SCOPE**

2.1.1 The overall objective of the audit review was to evaluate the economy, efficiency and effectiveness of the Department of Conservation and Environment's management of its fire protection activities, embracing both fire prevention and fire suppression.

2.1.2 The review focused on:

- ▶ an examination of the Department's policies, strategies, systems and procedures in relation to fire prevention and suppression;
- ▶ the gathering and analysis of relevant cost and analytical data for the purposes of examining economy and efficiency issues;
- ▶ determining the degree of compliance by regions with head office policies and directives;
- ▶ an assessment of the quality of the Department's monitoring of fire operations on a State-wide basis; and
- ▶ the adequacy of the Department's accountability to the Parliament in relation to fire prevention and suppression.

2.1.3 Selected regions were visited during the course of the review and one of the departmental fire training exercises was attended.

2.1.4 A number of post-fire reviews conducted by the Department were also examined by audit to determine the extent to which effective action had been taken by way of the introduction of improved fire suppression procedures for future fires.

2.1.5 In addition, discussions were held with representatives of a number of external organisations involved with, or having a specific knowledge of, fire protection activities.

2.2

BACKGROUND TO FIRE PROTECTION**MANAGEMENT OF FIRE PREVENTION AND FIRE SUPPRESSION IN THE STATE'S FIRE PROTECTED AREAS**

2.2.1 The Department of Conservation and Environment is required, under the provisions of the *Forests Act 1958*, to manage the prevention and suppression of fire in every State forest and national park and on all protected public land. The Department describes its areas of responsibility as the *fire protected areas* of the State.

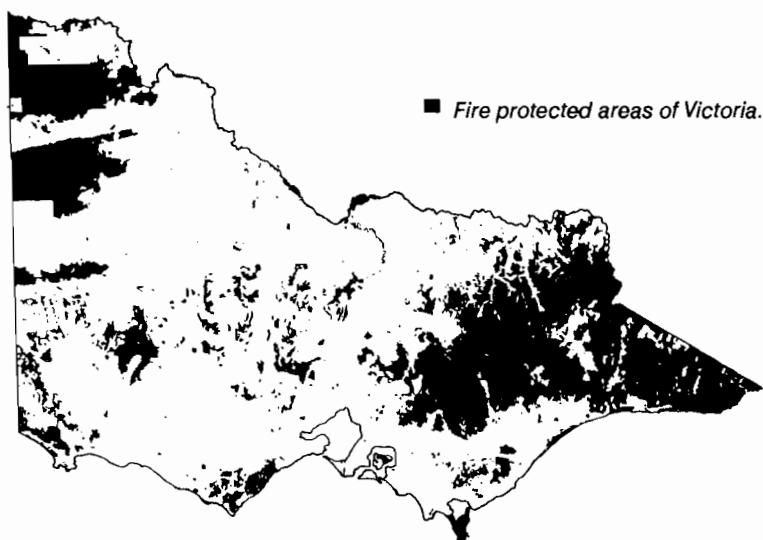
2.2.2 In addition to the specific legislative requirement governing fire prevention and suppression, the *Country Fire Authority Act 1958* imposes a responsibility on the Department (and every other public authority of the State) to take all practicable steps (including controlled burning) to prevent the occurrence of fires, and to minimise the danger of the spread of fires on or from any land vested in it or under its control.

2.2.3 The responsibility for fire protection in those country areas of the State which are not under the control of the Department rests with the Country Fire Authority.

2.2.4 The Department's responsibilities for fire protection encompass around 8.7 million hectares of land in Victoria which is equivalent to approximately 38 per cent of the State's total land mass.

2.2.5 The functions associated with the formulation of policy and strategic overview of operational tasks for fire protection are undertaken within the Department by the Fire Management Branch. The Branch's activities involve the co-ordination of fire prevention and suppression programs across the Department's 16 regions.

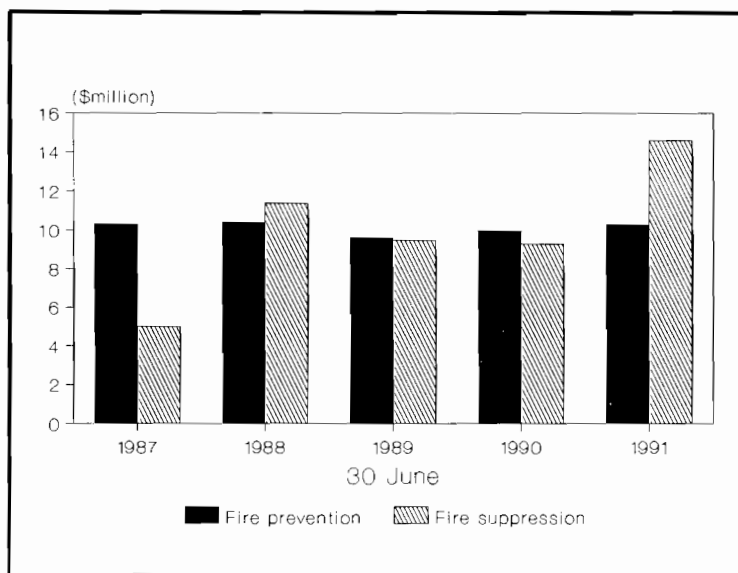
2.2.6 The following map depicts the extent of the Department's responsibilities across the State.



Annual expenditure on fire prevention and suppression

2.2.7 Expenditure levels for the 2 categories of fire protection activities, over the 5 year period 1987-1991, are shown in Chart 2.2A.

CHART 2.2A
EXPENDITURE ON FIRE PREVENTION AND SUPPRESSION



2.2.8 The aggregate expenditure by the Department on fire prevention and suppression, over the 5 year period shown in the chart, totalled \$100 million with average annual outlays at around \$20 million. Expenditure on fire prevention and fire suppression activities in 1990-91 totalled \$24.9 million. Estimated expenditure for the current financial year is \$20.4 million, comprising \$9.4 million for fire prevention and \$11 million for fire suppression.

2.2.9 Major activities financed by the above expenditure include:

- ▶ payroll and operating costs concerned with the implementation of fire prevention works, patrol of areas, investigation of fire causes and permit inspections;
- ▶ plant, vehicles, equipment and aircraft hire;
- ▶ development and maintenance of roads and tracks required primarily for access during fire suppression operations;
- ▶ construction and maintenance of facilities for use during fire operations including airstrips, dams, refuges and fire look-outs;
- ▶ research and development expenses; and
- ▶ program administration costs.

PART 3

FIRE PREVENTION

3.1

FIRE PREVENTION**HOW SIGNIFICANT IS FIRE PREVENTION?**

3.1.1 The Department of Conservation and Environment has defined *fire prevention* as all activities which protect life, property and other assets from wildfire (i.e. uncontrolled fire), which minimise the incidence and restrict the spread of wildfire, and which prepare for effective and efficient fire suppression.

3.1.2 When one considers the nature of the Department's fire prevention responsibilities, in terms of the protection of human life, State forests, national parks and other public lands, it is not difficult to form the view that fire prevention must rank as one of the most important responsibilities of government.

3.1.3 The importance of fire prevention and its overall significance to the State of Victoria was illustrated by the findings of an official Board of Inquiry set up by the Victorian Government in 1977, following major fires in that year, which stated, inter alia:

"The prevention of fire should be uppermost in the minds of all country people and of all organisations operating in the country areas. The main factor militating against fire prevention work is a general failure to recognise the importance of such work and of what is actually needed for effective prevention. As a result there is general reluctance to allocate the necessary time and money to fire prevention."

and

"The lesson of 1977 is that the financing of fire prevention should be among the very highest priorities. To save money on fire prevention is, of course, being penny wise and pound foolish. One day of bad fires costs millions measured only in money, to say nothing of death, injury and heartbreak and the cost of adequate prevention, though heavy, is small in comparison."

3.1.4 Given the compelling nature of the above comments, audit sought, during the review, to determine whether the Department's strategic management processes for fire prevention adequately address these warnings.

SHORTCOMINGS IN THE DEPARTMENT'S STRATEGIC MANAGEMENT OF FIRE PREVENTION

3.1.5 The Department attaches substantial significance to its fire prevention responsibilities. High-level strategic objectives for fire prevention have been embodied in its current corporate plan. In addition, over the years, periodic reassessments of fire prevention activities have been conducted. A review by the Department in 1984 led to the introduction, in that year, of a revised long-term strategic framework for fire prevention, the major component of which involved the preparation by regions of fire protection plans spanning a timeframe of 10 years. These plans are designed to document the long-term objectives and strategies for fire protection within each region.

3.1.6 Audit found that the **long-term planning** process for fire prevention had not progressed in the manner envisaged by the Department. In fact, at the time of the audit, **only 8 of the Department's 16 regions had finalised long-term plans even though over 7 years had elapsed since commencement of preparation of the plans. Given this unsatisfactory situation, the Department has not been able to consolidate regional plans into a State-wide strategic plan or to assess the overall risk to the State's protected areas of destruction or damage by fire.**

RESPONSE provided by Director-General, Department of Conservation and Environment

The Department shares the concern of audit that progress with formally approved regional fire prevention plans has been slow in some regions. The most fire prone regions have approved plans. Further, where a formal approved plan is not available, a draft plan or approved plans from the previous planning cycle are utilised. The apparent inference that because a current approved plan is not in place there is no regional fire protection program is not accepted.

Planning is an ongoing and dynamic process and all plans across the State will rarely be at the same state of completeness at a particular time. The Department's appreciation of the State-wide risk is based on the aggregation of all of its regional fire protection plans, whether they be finalised, in draft form, or being reviewed. It is thus not accepted that the Department has been unable to assess the overall risk to the fire protected area.

3.1.7 In relation to **short-term planning**, regions prepare annual work plans which document fire prevention activities envisaged for the coming 12 months. These work plans are an important element of the process under which regions make annual bids for funding allocations based on local priorities for fire prevention.

3.1.8 Because of the poor state of the Department's long-term planning procedures for fire prevention, the level of funds allocated to regions and the extent of work undertaken on particular fire prevention tasks may be influenced by the persuasiveness and quality of individual regional bids. **With this situation, it becomes difficult for the Department to determine, with any confidence or accuracy, whether the allocation of funds across regions in any one year will lead to the maximum containment of the risk of fire in the State's protected areas.**

3.1.9 Audit has discussed with the Department the importance of upgrading the quality of its management of fire prevention, pointing out that the Department lacks a State-wide risk profile for fire prevention which systematically links the key elements of fire prevention activities into a structured framework. This framework should drive critical strategic decisions such as the assessment of the risk of fire to the State's protected areas, periodic allocation of scarce resources and on-going monitoring of the effectiveness of fire prevention activities.

3.1.10 By following the above suggestions, the Department would be in a position to:

- ▶ systematically assess regional long-term plans for fire prevention incorporating a critical evaluation of the impact of past preventative outlays in minimising the incidence of fires;
- ▶ consolidate regional plans into a State-wide strategic framework;
- ▶ identify resource requirements needed to contain fire prevention risk across the State to an acceptable level;
- ▶ allocate available funds to regions for fire preventative purposes on the basis of specified risk factors; and
- ▶ progressively monitor resource management by regions to ensure funds are used to the greatest effect and with maximum efficiency.

3.1.11 In summary, the risk of fire to human life and valuable assets of the State demands a more structured approach by the Department in achieving optimum effectiveness in fire prevention.

RESPONSE provided by Director-General, Department of Conservation and Environment

The Department's record of performance in firefighting is one of progressive improvement over the last decade. Its prioritisation of funding allocation on the basis of the regional fire protection programs is considered sound, and compares at least favourably with that used by other large resource management organisations. This process is now supported by the FIRES computer system, which among other capabilities, enables the analysis of data on a State-wide basis from every fire attended by the Department in the last 20 years. The Department therefore manifestly does not agree with audit that, having regard to all of the complexities of the current operating environment, sufficient standards of protection are not being implemented.

The Department holds a strongly dissenting view to that of audit regarding its capability for strategic analysis of fire suppression information. The Fire Management Branch has established a strategic process of high standard to collect and analyse the dynamic fire suppression situation on public and adjoining private lands and has a proven record of performance in this field. The Department's co-ordinating system provides information from a fire control headquarters to the central operations room in a timely manner, where it is collated, analysed and loaded into the FIRES computer database. This is a significant strategic capability which places the Department in a position of world leadership. This ought to be recognised. The Department's process is at least the equivalent of those employed in large resource management organisations elsewhere around the world.

Adequacy of the State's funding arrangements for fire prevention

3.1.12 The allocation of funds for fire prevention in the State's protected areas is not presented for parliamentary sanction within the annual Appropriation Act as a separate line item. Funding for fire prevention is provided from various funding sources across the Department's Land Resource Management program. Consequently, the Parliament and the taxpaying public are not informed of the amount of funds earmarked each year through the budget process for fire prevention.

3.1.13 In 1990-91 the following funds were expended from the Land Resource Management program for fire prevention activities:

TABLE 3.1A. EXPENDITURE ON FIRE PREVENTION, 1990-91
(\$million)

<i>Item</i>	<i>Expenditure</i>
Salaries and wages	6.8
Hire of plant, equipment and aircraft	1.3
Materials	1.0
Other operating expenses	1.2
Total	10.3

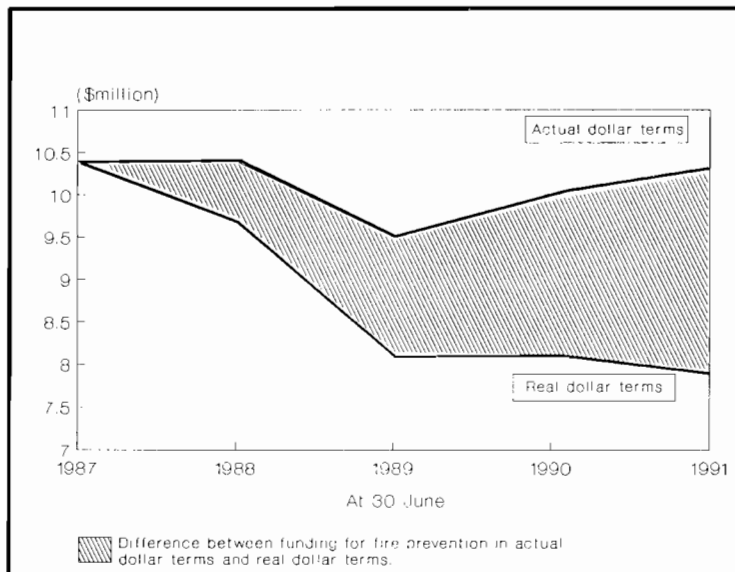
3.1.14 The quantum of funds allocated by the Department each year for fire prevention purposes is influenced substantially by the aggregate level of funds made available by the Government through the budget process for all departmental activities. A good example of the influence of the central budgetary process on funding for fire prevention occurred in 1991-92 when **a 12 per cent across-the-board cut to departmental budget allocations led to an arbitrary reduction by the Department of 7.5 per cent in funds (\$750 000) available for fire prevention.**

3.1.15 In the face of these funding cuts, the Department advised regions not to make any decisions or take any action which would in any way:

- ▶ reduce the Department's strategic capability to stop wildfires;
- ▶ reduce the Department's first attack response time;
- ▶ reduce reliability of firefighting equipment or put the lives of the Department's firefighting personnel at risk; and
- ▶ put more departmental and community property and lives at risk.

3.1.16 An examination of departmental expenditure on fire prevention activities over the 5 year period 1986-87 to 1990-91 showed that, in actual terms, annual outlays have been consistently around \$10 million, **although the real level of expenditure has in fact fallen by 23 per cent over the period.** Chart 3.1B illustrates this position.

**CHART 3.1B. DEPARTMENTAL EXPENDITURE ON
FIRE PREVENTION ACTIVITIES**



3.1.17 Many of the problems referred to later in this section of the Report in relation to fire access tracks, fuel reduction burning and firefighting equipment were attributed by the Department to funding pressures, with an ever-increasing gap between planned and actual fire preventative work because of the real reduction in funding.

3.1.18 In view of ad hoc reductions in funding levels for fire prevention and the absence of State-wide information on fire risk, the Department is not in a position to determine whether there has been over or under-funding of fire prevention in the State's protected areas.

3.1.19 The Board of Inquiry in 1977, mentioned earlier in this Report, stated that to save money on fire prevention is being "penny-wise and pound foolish". Audit is of the opinion that fire prevention is far too important an issue for funding decisions to be determined by annual budget negotiations or to be influenced by priorities placed on other activities, whether by government or the Department, in particular budget periods.

3.1.20 The overall significance of fire prevention is such that the funds provided for fire prevention activities should be clearly identified in the Department's annual appropriation for the perusal of the Parliament and, subsequently, the public.

RESPONSE provided by Director-General, Department of Conservation and Environment

With respect to comments made in paragraph 3.1.14, in 1991-92 the Department recognised the importance of fire prevention by limiting the reduction in funding to approximately half of that which applied to other departmental programs. In addition, an undertaking was given that should additional funds become available, fire prevention would be regarded as a priority in the allocation of these funds.

Poor state of fire access tracks, bridges and culverts

3.1.21 The Department is responsible for approximately 25 000 kilometres of fire access roads and tracks, and numerous bridges and culverts throughout Victoria.

3.1.22 The proper construction and regular maintenance of fire access tracks (which include bridges and culverts) are important fire prevention activities and essential prerequisites for effective fire suppression activities. In essence, effectively placed and maintained access tracks fulfil 3 key purposes, namely:

- ▶ speedy and safe access to firefighting personnel to fire areas;
- ▶ effective firebreaks for slowing the advancement or spread of fires; and
- ▶ a base for back-burning during fire suppression operations.

3.1.23 Fire access facilities are of major strategic importance for the Department, particularly in relation to:

- ▶ the fulfilment of its first strike capability requirement that, in the event of fire, its suppression action be fast, determined and thorough; and
- ▶ its ability to move large volumes of personnel and equipment to a fire.

3.1.24 **Notwithstanding the significance of fire access tracks to its overall fire prevention program, the Department has not established State-wide standards for such tracks in terms of their strategic purpose, location, condition or periodic maintenance.** Furthermore, standardised procedures have not been introduced for regular monitoring and reporting of the condition of tracks. Consequently, critical decisions by the Department on the level of funds earmarked periodically for construction or maintenance of access tracks in regions do not have a structured basis.

3.1.25 Concerns have been expressed to the Department by members of the public and other bodies in relation to the state of fire access tracks. Late in 1991, the severity of the problem was emphasised by a Country Fire Authority (CFA) Brigade in the following terms:

"In preparation for the forthcoming fire danger period, on Sunday 15 December officers of this Brigade conducted an inspection of the major access tracks of the Doongalla Forest. As a result of this inspection this Brigade wishes to convey its deep concern as to the condition of these access tracks. The inspection was conducted using Toyota 4WD vehicles which had considerable difficulty in negotiating the overgrown, deeply rutted and washed out tracks. Furthermore, this Brigade has resolved the following:

- (1) Under no circumstances would CFA tankers be permitted to operate on any track east of (or above) the Doongalla Homestead.*
- (2) That the Department of Conservation and Environment be required to carry out major vegetation cut back and track restoration to enable CFA vehicles to assist in any fire situation.*

To enable this Brigade to complete its planning, the Department's plan of action to eliminate this dangerous situation is requested to be forwarded to the Country Fire Authority forthwith."

3.1.26 The Department has advised that, due to lack of funds, no remedial action has been taken to eliminate this dangerous situation. Although in an emergency situation the Country Fire Authority may ultimately assist the Department in fire suppression activities in the stated area, which forms part of the Dandenong Ranges, the lives of firefighting personnel will be exposed to greater dangers than necessary.

RESPONSE provided by Director-General, Department of Conservation and Environment

The Department acknowledges the continuing contribution made by CFA Brigades to fire suppression on public lands over the years and is sympathetic to concerns that they hold about the quality of some access tracks. A formal liaison channel for this information exists at the Municipal Fire Prevention Committee meetings and at pre-season meetings held with departmental regional staff. Further means will be examined so that issues about tracks of strategic concern to CFA Brigades can be considered in the regional works programming process.

Additionally, the Department does not share the audit view that track condition as such compromises firefighter safety. Not all tracks can be maintained at a standard suitable for heavy firefighting equipment. Part of the first attack response is to ensure access is available by sending in reconnaissance or earth-moving equipment to ensure safe access. Tracks can be closed through tree-fall or other cause independent of engineering standard. In a fire situation, it is the decision to use the track which is critical to safety, highlighting the need for adequate training of personnel.



(Left) A deeply guttered and washed out track in the Alexandra region.

(Below) Collapsed bridge requiring urgent repairs to bridge and culvert.



3.1.27 During visits to 2 regions of the Department (Alexandra and Orbost) audit reviewed the adequacy and suitability of fire access tracks for fulfilling their critical roles in the prevention and control of fires. Audit found that:

- ▶ Many strategically-significant fire access tracks were in extremely poor condition and would not be effective in the event of fire. Some indication of the extent of this problem can be gleaned from the position at the Orbost region where regional staff had identified 32 bridges to be in an unsafe condition and 1 450 kilometres, or almost half of its total fire access tracks, in need of urgent maintenance;
- ▶ Several fire access facilities had reached such a serious state of disrepair that the Department had been forced to close-off access to its own staff and the bushwalking public for safety reasons;
- ▶ Many tracks had become overgrown with forest fuels (grasses, bushes and other combustible materials), a condition which substantially nullified their effectiveness as firebreaks;
- ▶ In the Alexandra region, one industrial union was so concerned at the poor condition of certain fire access tracks that it banned access to the tracks until improvement works were carried out; and
- ▶ Information held by regions on fire access tracks was maintained in a variety of forms, e.g. cards, computer records etc. and cannot be readily consolidated on a State-wide basis for strategic analysis and decision-making.

3.1.28 The above circumstances clearly portray a serious position in relation to this element of the Department's fire prevention capability. Departmental action is needed to upgrade the physical condition of many fire access facilities. If effective remedial action is not pursued, the implications to the State will be :

- ▶ a substantial reduction in the Department's strategic capability to suppress wildfires;
- ▶ the placing of firefighting personnel, public lives, and the State's flora and fauna at greater risks; and
- ▶ higher suppression costs in extinguishing future fires.



Unsafe bridge which has resulted in the closure of a major fire access track.

3.1.29 During discussions with the Department, audit was informed that corrective action to improve the level and quality of information on fire access tracks was initiated in November 1990. At that time, a working group was formed with the responsibility of establishing a standard State-wide register of roads and tracks to be operational by June 1992.

3.1.30 While audit recognises that such action is a positive initiative, **it is important that information available at the conclusion of the exercise is integrated into a risk-based strategic planning framework for fire prevention.**

RESPONSE provided by Director-General, Department of Conservation and Environment

The preceding comments fail to recognise that:

- The Department is progressively phasing out the use of certain tracks because of wilderness and other considerations; and*
- That the increasing use of aerial firefighting has greatly enhanced the speed and vigour of the Department's first attack capability throughout the public land estate, and particularly in remote locations. This, and a range of other factors, have recently changed the overall relevance of roads and tracks to fire protection. It is agreed that the completion of the proposed State-wide road register will facilitate the rationalisation of firefighting access for public lands. This is an initiative which is currently under development.*

Fuel reduction burning (controlled burning off)

What is its overall significance in terms of fire prevention?

3.1.31 Fuel reduction burning can be described as the process under which fires are deliberately lit by official personnel so that, under controlled conditions, fuels on forest floors, i.e. undergrowth and debris, are reduced to acceptable levels.

3.1.32 In 1986, the Department formulated a policy on fuel reduction burning. This move was designed partly to accentuate the importance of the activity as a key element of the fire prevention program. Under this policy, the principal objective of the burning process is to reduce fuel quantities to levels where a wildfire which originates inside, or spreads onto, a fuel reduced area will be slowed or stopped. The policy indicates that fuel reduction burning diminishes the severity and speed of fires by reducing the:

- ▶ total weight of fuels at ground level, thus minimising the rate of spread and intensity of fires;
- ▶ height of the fuel bed so as to lower the probability of fires which travel from treetop to treetop (referred to as crown fires) and to improve visibility for fire suppression forces; and
- ▶ amount of combustible materials to lessen the potential of fires to generate spotfires ahead of the main fire.



Area that has been subjected to fuel reduction burning.

3.1.33 Some indication of the benefit of fuel reduction burning as a fire protection measure can be gleaned from the following comment also made by the 1977 Board of Inquiry:

"The fuel reduction burning program was illustrated graphically in the Ross Creek area, (an area south-west of Ballarat); the effect of the fuel reduction as compared to that part of the forest where no such process has taken place was quite dramatic."

3.1.34 The Department advised audit that fuel reduction burns are primarily restricted to the autumn and spring seasons of the year. In essence, the timing of burns depends on the specific seasonal conditions of a particular year and the impact of such conditions in the various regions.

Effectiveness of the Department's fuel reduction burning program

3.1.35 The Department's long-term planning strategies for fuel reduction burning are embodied in periodic fire protection plans prepared by regions. In the development and ongoing monitoring of plans, regions are required to be cognisant of a number of factors including the likely effects of burning on specific plant species, wildlife habitats, recreational facilities and areas used for commercial purposes.

3.1.36 For some years, departmental guidance available to regions in formulating fuel reduction burning strategies was general in nature due to the absence of specific performance targets governing burning in designated areas across the State. Consequently, the Department was not in a position to judge, with any certainty, the effectiveness of its operations in this critical area of fire prevention.

3.1.37 It was not until 1988-89 that the Department took the important strategic step of categorising all land under its control into 4 priority burning zones with specific targets established to contain fuel levels within each zone. The targets were based on consideration of research conducted in Australia on fire behaviour. Details of the specific priority burning zones together with targets are provided in Table 3.1C.

TABLE 3.1C. PRIORITY BURNING ZONES AND RELATED TARGETS

Priority zone objective	Departmental target
Zone 1 - Achieve the highest level of protection to life, property and public land.	Restrict fuel quantities to below 8 tonnes per hectare.
Zone 2 - Establish a strategic corridor of sufficient width and continuity to provide a substantial barrier to the spread of wildfire, and to reduce fire intensity and damage.	Restrict fuel quantities in an adequate area of the zone to within 12 tonnes per hectare.
Zone 3 - To identify broad burning areas, to reduce severity of wildfire, and prevent destruction of natural and cultural assets.	Restrict fuel quantities within identified areas to below 12 tonnes per hectare.
Zone 4 - To provide for fuel reduction burning in all other areas as necessary.	No specified target; fuel quantity levels to complement targets in higher priority zones.

3.1.38 In assessing the soundness of the Department's procedures for progressively evaluating the effectiveness of its fuel reduction burning, audit expected to find that data comparing the actual level of forest fuels in priority zones against the specific departmental targets was systematically gathered and evaluated.

3.1.39 However, the review found that, although regions submit annual details of actual levels of burning against planned targets, such information is not consolidated on a State-wide basis in a timely manner. In addition, no information is gathered by the Department to progressively monitor the quantum of ground fuel in priority zones against its stated objectives. **As a consequence, the Department is unable to determine the overall fire risk to the State's protected areas in terms of the accumulation of ground fuels, and it is not in a sound position to make informed decisions concerning the allocation of funds in each year for this important facet of its fire prevention activity.**

RESPONSE provided by Director-General, Department of Conservation and Environment

The Department has confidence in its present monitoring system and refutes the audit contention that it is unable to determine the overall fire risk and is not in a sound position to make informed decisions about funding allocation.

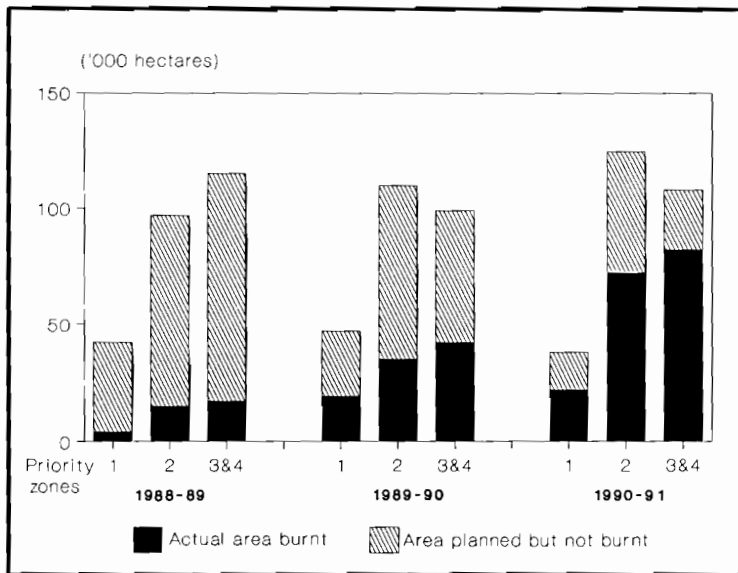
The measure relevant to central (strategic) management is progress against the proposed fuel reduction burning targets for each priority zone. This is directly related to approved fire protection objectives as stated in the regional program and this is monitored centrally when allocations are granted against the regional bids for fuel reduction funding. The "quantum of ground fuel" is an operational measure which is relevant at the task level and no advantage is seen to accrue from monitoring this centrally.

3.1.40 Given the circumstances, audit consolidated and analysed regional data on actual against planned fuel burning and obtained estimates from regions on ground fuel quantities within priority burning zones.

Comparison of planned with actual controlled burns

3.1.41 Chart 3.1D shows details of the audit analysis of planned against actual burns over the 3 year period 1988-89 to 1990-91.

**CHART 3.1D
CONTROLLED FUEL REDUCTION BURNING BY DEPARTMENT**



The above figures do not take into account those areas burnt by the accidental occurrence of wildfires.

3.1.42 The chart shows an increased level of burning in 1990-91 compared with the 2 earlier years. The Department advised audit that the major factors contributing to the lack of achievement of its planned fuel reduction burning program during 1988-89 and 1989-90 were:

- ▶ unfavourable weather conditions;
- ▶ insufficient levels of funding; and
- ▶ inadequate priority given by regions.

3.1.43 The improvement in the level of controlled burning in 1990-91 compared with the 2 earlier years was specifically attributed by the Department to an unusually favourable year in terms of weather conditions. Notwithstanding these favourable conditions, the aggregate level of controlled burning was still substantially below that planned for the year. In other words, the Department was not able to take full advantage of the favourable climatic conditions to eliminate all arrears in its fuel reduction burning program.

3.1.44 The most disturbing feature of the audit analysis was that, in each of the 3 years, the lowest level of burning occurred in zone 1. In fact, 8 of the Department's 16 regions achieved less than 50 per cent of planned burns in priority 1 zones during 1990-91. **As such, the pattern of controlled burning was directly contrary to the Department's priority ranking and those areas warranting the highest level of protection to human life, property and public assets had in fact received the lowest level of protection.**

3.1.45 In discussing the results of the audit analysis, the Department explained that, because burning in priority 1 zones is carried out near populated areas or high value assets, the process is substantially more labour intensive and requires greater control than in lower priority zones. Audit considers that this philosophy is based more on the degree of perceived difficulty in the undertaking of controlled burning rather than on the relative significance of public assets. Widespread application of this philosophy would negate the fundamental purpose of a priority-ranking framework for controlled burning based on the significance of protected areas.

3.1.46 The failure of the Department to achieve its planned fuel reduction burns each year has resulted in an increasing accumulation of fuel on forest floors. This accumulation:

- ▶ makes Victoria's forests and protected lands more susceptible to the occurrence of fires; and
- ▶ leaves the Department at risk on the ground that insufficient work for the prevention of fires has been undertaken.

Comparison of ground fuel levels with departmental targets

3.1.47 The task of assessing the actual levels of ground fuels against departmental targets required audit to obtain relevant estimates from regions as the required information was not centrally gathered. Regions experienced substantial difficulties in providing this information as they are not required to regularly measure fuel levels, to evaluate their performance against the departmental targets or to progressively report their position to the Department.

3.1.48 Notwithstanding the significance of this element of the fire prevention program, the Department did not strategically assess in a systematic manner the State's fire risk from excessive levels of combustible ground fuels in protected areas.

3.1.49 The audit analysis indicated that, in the majority of regions, ground fuel levels were higher than the Department's targets. Table 3.1E illustrates this position in those regions where a high percentage of priority zone 1 areas contained excessive levels of fuel quantities over the last 3 calendar years.

TABLE 3.1E
PRIORITY ZONE 1 AREAS WHICH CONTAIN FOREST FUELS
IN EXCESS OF DEPARTMENTAL TARGETS OF 8 TONNES
PER HECTARE
 (per cent)

<i>Region</i>	<i>December</i>		
	<i>1989</i>	<i>1990</i>	<i>1991</i>
Horsham	92	68	71
Geelong	78	71	60
North-East	60	60	50
Yarram	73	80	50
Benalla	65	60	35

3.1.50 During visits to the Alexandra and Orbost regions and to Blackwood, in the Geelong region, audit observed situations in some priority 1 zones where regional staff estimated that fuel loads were in the range of 20 to 60 tonnes per hectare, **or up to 7 times greater than departmental targets.**



Priority 1 zone in the Geelong region with fuel level estimated by departmental staff at approximately 60 tonnes per hectare.

3.1.51 The existence of fuel levels of this magnitude and the extent of regional areas where fuel loads are in excess of targets demonstrates that effective fire prevention strategies have not been implemented within the Department.

3.1.52 Given the absence of central monitoring of ground fuel levels in the fire protected areas across the State, the Department is not in a position to:

- ▶ determine those regions which represent the greatest fire risk in terms of fuel loads; and
- ▶ ensure that resources, such as funds and equipment, are allocated to regions on the basis of a systematic risk assessment.

RESPONSE provided by Director-General, Department of Conservation and Environment

The purpose of a fuel reduction burn is not so much to reduce fuel uniformity over an entire area, as to create a mosaic of small fuel-reduced zones. While fuel levels revealed by spot sampling may be a multiple of the target fuel level, the fuel reduction burn would still meet the requirement overall.

The annual planned fuel reduction targets assume ideal burning conditions. Actual achievements reflect prevailing seasonal conditions. Therefore, it is not unusual for the target to be under-achieved. However, priority for fire prevention works (including fuel reduction burning, slashing and fire break construction) is given to the protection of life and property in high risk zones.

3.1.53 It is interesting to contrast the Department's lack of information on ground fuels with the approach followed by the Country Fire Authority. By using satellite pictures, produced by the Commonwealth Scientific and Industrial Research Organisation of the density and degree of dryness of grass, that Authority has been able to identify those areas of the State which are most vulnerable to fires.

3.1.54 The Department has advised audit that it was not possible to apply this particular methodology to its fire protected areas because of the predominance of forest cover. However, the fact that there are difficulties in applying such scientific measures of fuels to the Department's areas of responsibility reinforces the need to ensure that information on fuels from its own measurement procedures is systematically gathered and used for decision-making.

3.1.55 **The Department should promptly re-assess:**

- ▶ **the extent to which it can effectively gather information and monitor the risks associated with the levels of forest fuels; and**
- ▶ **formulate a strategy which will ensure that the level of forest fuels throughout the State is contained within its specified targets.**

3.1.56 Some of the areas which may warrant consideration during this process include:

- ▶ a review of the level of priority given by regions to fuel reduction burning;
- ▶ the feasibility of extending the spring burning season in favourable weather conditions;
- ▶ an evaluation of the sufficiency of funds provided for fuel reduction burning programs; and
- ▶ the potential for increasing the Department's overall resources in fuel reduction activities by enlisting the assistance of the local community and environmental interest groups or by obtaining additional funds through financial sponsorship from corporate bodies.

Adequacy of departmental firefighting equipment

Level of firefighting equipment held by Department

3.1.57 The availability of modern, well-maintained and efficient firefighting equipment is a critical pre-requisite for an effective firefighting capability.

3.1.58 Most of the Department's firefighting equipment is dispersed throughout its regional offices and work centres. A central fire equipment facility, located at Altona, is used as a service and repair centre, and a storage and dispatch facility. Regions have a choice of acquiring items through the Altona facility or direct from local suppliers.

3.1.59 The replacement value of the Department's firefighting equipment at 30 June 1991 was \$14.3 million. Table 3.1F provides relevant details.

**TABLE 3.1F
NATURE AND VALUE OF FIREFIGHTING EQUIPMENT,
AT 30 JUNE 1991**

<i>Nature of equipment</i>	<i>Number of items</i>	<i>Replacement value(a)</i>
		(\$m)
Tankers	100	9.2
Trailers	282	1.6
Pumps	969	1.3
Slip-on units (b)	337	0.7
Retardant mixers	21	0.6
Other equipment (c)	..	0.9
Total	1 709	14.3

(a) Historical cost of equipment not available.

(b) Multi-purpose fire units.

(c) Includes numerous minor items of equipment.

3.1.60 In addition to the use of its own equipment, the Department has entered into arrangements under which it leases or has access to equipment of other authorities, such as municipalities and the Country Fire Authority, for firefighting purposes. Such equipment is available for use on a needs basis to supplement the Department's own resources in emergency fire situations.

Condition of firefighting equipment

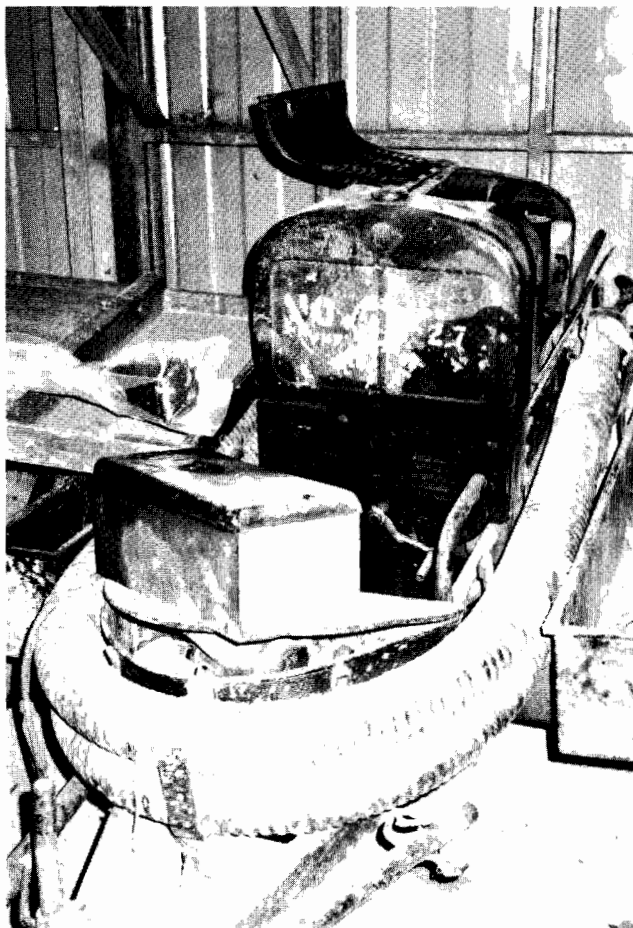
3.1.61 The primary responsibility for ensuring the adequacy of firefighting equipment available for use within the Department rests with regions. Annual bids for funding allocations are made by regions based on local assessments of equipment needs.

3.1.62 For some years now, an important element of the Department's monitoring procedures for fire equipment has been an annual inspection of regional equipment by its fire equipment supervisor. In the past, this process involved only the preparation of individual reports on the quality of equipment to regions and there was no overall assessment made of the State-wide condition of firefighting equipment held by the Department.

3.1.63 In 1991, the procedures of the fire equipment supervisor were extended to encompass a consolidated report on the status of the Department's fire equipment. **This comprehensive high quality report presented a rather disturbing assessment of the poor condition of much of the Department's firefighting equipment across the State.** Some of the more significant findings documented in this report were:

- ▶ approximately 31 per cent of fire equipment on hand needed to be replaced at a cost to the Department of around \$4.5 million;
- ▶ a number of fire tankers had serious mechanical steering problems which could cause serious or fatal accidents;

- ▶ 40 per cent of tankers were over 10 years old and, in addition to concerns over their continued effectiveness, parts were no longer readily available for tankers of this age;
- ▶ 58 per cent of the fire pumps were not available for immediate use as they required repairs or were in need of replacement; and
- ▶ although the Department is a major user of foam for firefighting purposes, more than half of the slip-on units (multi-purpose fire units) had not been fitted to utilise foam.



Departmental pump approximately 40 years old.

3.1.64 The fire equipment supervisor summarised his overall recommendations as follows:

"From my inspection of the fire equipment around the State I would have to say that some of the areas are well below standard and need to put more effort into upgrading, servicing and storage."

3.1.65 Despite the strategic significance of these comments, the consolidated report had not been circulated to the executive management of the Department or to regions.

3.1.66 It is important that the Department ensures that the findings of the report are acted upon to swiftly improve its firefighting capability. Failure to upgrade firefighting equipment could expose departmental personnel and the protected areas of the State to greater risks.

RESPONSE provided by Director-General, Department of Conservation and Environment

Funding priority in this program has been given to front line fire equipment for effectiveness and safety reasons. A review of establishment levels and an accelerated replacement program will be undertaken to rationalise and update holdings subject to availability of funding. It should be noted that while a number of pumps are due for replacement they remain in a serviceable condition.

Steering problems on the 4 tankers involved were immediately rectified following notification by the inspector.

Foam technology is a recent innovation which is being introduced on a programmed basis, as funds allow.

Equipment levels

3.1.67 The development of an equipment establishment level is useful in providing a general guide on the quantity of firefighting equipment that should be placed in regions to ensure the strategic and optimal placement of equipment.

3.1.68 Audit inquiries revealed that the Department had not carried out a State-wide review to determine standard fire equipment establishments. An examination of fire equipment information, at replacement value, disclosed the existence of large differences between the regions.

3.1.69 Audit accepts that basic differences exist between regions due to type of terrain, vegetation, local support, fire history, existence of plantations and State forests which justify variations in the nature and volume of equipment held. However, in the absence of general guidelines in the form of an equipment establishment it is not possible to determine whether the optimum level of equipment has been allocated to each region.

3.1.70 A major factor that has contributed to the disparate amounts of equipment within the regions has been the policy of the Department to allow regions to allocate funds from their appropriations towards the purchase of equipment. This has meant that equipment purchases have been made on the basis of regional priorities and preferences rather than established equipment levels. Some regions therefore have spent more on equipment than others over the years.

3.1.71 The Department should develop guidelines to enable the determination of the nature and quantities of firefighting equipment that should be located in the various regions of the State. Audit was advised that a departmental officer has recently commenced preliminary work in this area and that a fire tankers review committee has been established to determine tanker requirements throughout the State.

RESPONSE provided by Director-General, Department of Conservation and Environment

It is agreed that equipment allocation on a risk-related basis as suggested by audit is desirable because this forms the basis of the present allocation. It is also agreed that technology offers potential for improvements; development of a strategy which had commenced prior to the audit is continuing.

Performance standards and specifications for fire equipment

3.1.72 The Department has, in certain instances, conducted its own research and testing and determined specifications and performance standards to be met before equipment is accepted. Instances in which this has occurred included specifications for fire tankers, tents and fire pumps. The Department has not, however, established formal and documented performance standards and specifications for all groups of fire equipment.

3.1.73 Departmental regions are able to purchase items of fire equipment such as pumps, trailers and chain saws locally or may obtain such items through the Altona equipment pool. The purchase of fire equipment by the Altona equipment pool will ensure it is attained at competitive prices, will generally perform satisfactorily, and will be similar or compatible to that used by other regions. The ability of regions to buy fire equipment locally, without the benefit of centrally-set performance standards and specifications, may result in:

- ▶ equipment not purchased at the best price;
- ▶ equipment not performing at a satisfactory level; and
- ▶ equipment not compatible with that used by other regions.

3.1.74 The Department should develop performance standards and specifications for all major groups of equipment to be used by all regions as a guide to equipment purchases.

Training of firefighting personnel

3.1.75 The need for expertise in firefighting techniques and the use of specialised firefighting equipment emphasise the importance of structured training for effective fire protection.

3.1.76 Each year the Department undertakes a skills needs analysis from data prepared by regions, as part of the development of an annual program of specialised firefighting courses. Approximately 80 per cent of training is provided at regional level with the balance undertaken centrally at the Department.

3.1.77 A review by audit of the latest needs analysis and of the central training courses held in 1990-91 revealed that:

- ▶ approximately half of the year's program was not presented due to funding limitations; and
- ▶ only 63 per cent of staff identified as needing training in the courses actually held were able to be trained.

3.1.78 The Department should ensure that training needs are more adequately fulfilled so that firefighting personnel are fully skilled in all facets of firefighting operations.

RESPONSE provided by Director-General, Department of Conservation and Environment

The audit statement is not accepted. In departmental terms, the schedule of training courses which is listed for implementation is known as the "training program". This was fully completed. The training program is compiled from the "needs analysis" for central training. Available resources were allocated to the highest priority training, and the unaddressed needs were rolled-over for consideration in this year's training program. A 50 per cent address of needs for 63 per cent of the numbers nominated in any one year is considered reasonable by any organisational standards.

PART 4

FIRE SUPPRESSION

4.1

NATURE OF FIRE SUPPRESSION

4.1.1 The Department of Conservation and Environment defines *fire suppression* as all activities connected with standby, i.e. on fire alert, and with extinguishing a wildfire following its detection. Fire suppression also encompasses post-fire activities such as the rehabilitation of areas cleared following the process of fire extinguishment.

4.1.2 In contrast to fire prevention, fire suppression has distinctive unpredictable or uncontrollable characteristics, in that much of the activity occurs as a result of accidents, e.g. lightning strikes which accounted for almost 30 per cent of all fires over the last 5 years. Because of these characteristics, unlike the funding of the fire prevention program, fire suppression has been accorded a separate appropriation line item for budgetary purposes.

4.1.3 The Department's principal responsibility in the area of fire suppression is to ensure that all fires are efficiently and effectively extinguished. It has documented procedures for initial attacks on fires, the specific chains of command to apply to major fires and the resource arrangements necessary to manage and extinguish fires. In addition, most regions have developed fire suppression plans based on their knowledge of the area and specific requirements.

4.1.4 Some indication of the extent to which the Department has been called upon in recent years to suppress fires can be gained from Table 4.1A which summarises the number and causes of fires attended by the Department over the 5 year period 1986-87 to 1990-91.

**TABLE 4.1A
NUMBER AND CAUSES OF FIRES ATTENDED BY THE DEPARTMENT**

Year	Caused by-					Total
	Lightning	Lit deliber- ately	Lit unintentionally	Burning off	Other(a)	
1986-87	117	107	103	67	109	503
1987-88	339	120	154	88	169	870
1988-89	181	72	82	73	105	513
1989-90	124	105	134	86	170	619
1990-91	226	220	143	84	181	854
Total	987	624	616	398	734	3 359

(a) Includes fires caused by exhausts, fireworks, power transmission lines, trains, waste disposal systems etc.

FUNDING OF FIRE SUPPRESSION ACTIVITIES

4.1.5 Over the past 5 years, annual outlays on fire suppression have averaged \$10 million, with expenditure in 1991-92 estimated to be \$11 million. Given the labour-intensive nature of fire suppression activities, salaries and wages constitute a sizeable proportion of annual outlays (approximately 64 per cent or \$7 million of the 1991-92 estimated expenditure of \$11 million).

4.1.6 An important element of the annual labour cost of fire suppression involves the engagement of additional firefighting staff during the December - March period. In 1990-91, the Department engaged 400 summer personnel at a cost of \$2.5 million and a similar number were engaged for the 1991-92 fire season.

4.1.7 When the additional fire personnel are not involved in fire suppression duties, they are employed on a range of fire prevention tasks including construction of fire breaks and track clearing as well as other departmental functions such as rabbit control and seed collection.

4.1.8 The audit review found that the Department does not document the time spent by summer firefighting personnel on fire suppression as distinct from the fire prevention duties and functions unrelated to fires.

4.1.9 The availability of such information would provide a sounder base for decisions on the level and placement of each year's summer labour intake. In addition, under the current procedures, time spent on non-suppression activities is incorrectly allocated against the fire suppression funding line item.

4.1.10 **With the more complete information suggested by audit, the Department's allocation of costs would be more accurate and the annual funding allocation from the Government for the vitally important fire suppression program would be more soundly based.**

RESPONSE provided by Director-General, Department of Conservation and Environment

In relation to the audit assertion regarding incorrect allocation of time, additional firefighting personnel are engaged against the estimated risk of fires occurring in a particular region in a particular season. Irrespective of the task in hand, they are required to be immediately available to fight fires anywhere in the State. Work other than firefighting is thus opportunistic and an alternative to "standing by" for firefighting which is the custom in some fire services. On this basis the Department cannot agree that the fire suppression funding line is incorrectly applied to all work performed by these employees.

Many advantages accrue to fire suppression capability from the other work including terrain familiarisation, work hardening and development of team spirit. The Department does monitor and is able to report on the activities performed by these personnel.

HOW DOES THE DEPARTMENT ASSESS THE EFFECTIVENESS OF FIRE SUPPRESSION ACTIVITIES?

4.1.11 In essence, the Department's approach to evaluating its effectiveness in fire suppression comprises 2 main elements, namely:

- ▶ an annual performance target of keeping the size of fires below 5 hectares; and
- ▶ use of post-fire debriefings.

Adequacy of single performance target

4.1.12 For a number of years, the Department has utilised a fire suppression performance target of keeping the size of fires below 5 hectares. In its *Annual Report* for 1990-91, the Department advised Parliament that it was able to meet this strategic goal for 87 per cent of fires compared with 89 per cent in 1989-90 and 85 per cent in 1988-89.

4.1.13 Although the establishment of a performance target represents a positive step by the Department, the use of one single measure may provide limited or even misleading information on the level of attained performance. For example, in the case of the Department's measure, the recording of many small fires requiring little suppression effort would artificially overstate periodic performance.

4.1.14 Audit conveyed to the Department a range of additional measures it could use to better evaluate its overall performance in fire suppression. The audit suggestions included the following indicators which focus on response time to attend fires and time taken to arrive at fires:

- ▶ time elapsed between notification of a fire and dispatch of fire crew to extinguish the fire (a measure of *response time*); and
- ▶ time taken by fire crews to arrive at the fire location (an *arrival time* measure which determines whether fire resources are strategically located).

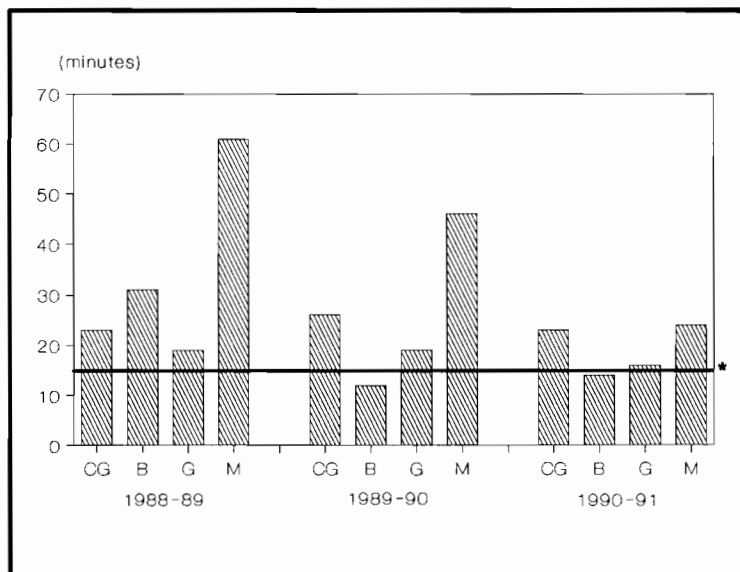
4.1.15 Audit research indicated that the use of *response time* as an indicator is commonly used by firefighting authorities, both local and overseas. **While the Department places high importance on its ability to extinguish fires in the shortest possible time, and relevant data is recorded within its management information system, it does not systematically analyse such data to measure its overall fire response performance.**

4.1.16 Given this situation, audit analysed fire information statistics pertaining to 4 regions, for the fire season over the 3 year period 1988-89 to 1990-91, in respect of both the response time and arrival time performance measures suggested to the Department.

Response time measure

4.1.17 For the *response time* measure, audit applied the performance standard of 15 minutes between notification of a fire and dispatch of a crew. This standard is used by the Canadian Ministry of Natural Resources. Chart 4.1B shows the performance of the 4 regions against this standard for the examined period.

CHART 4.1B. RESPONSE TIME OF FIRE CREWS



* Canadian Ministry of Natural Resources standard of 15 minutes.

CG	: Central Gippsland	G	: Geelong
B	: Bendigo	M	: Mildura

4.1.18 The chart illustrates significant variations in dispatch time between the 4 regions. Also, while there has been an improvement in response time of the regions over the period, 3 of the 4 regions exceed the standard of 15 minutes.

4.1.19 In discussions on these results, the Department indicated that various factors can influence dispatch time of fire crews, including:

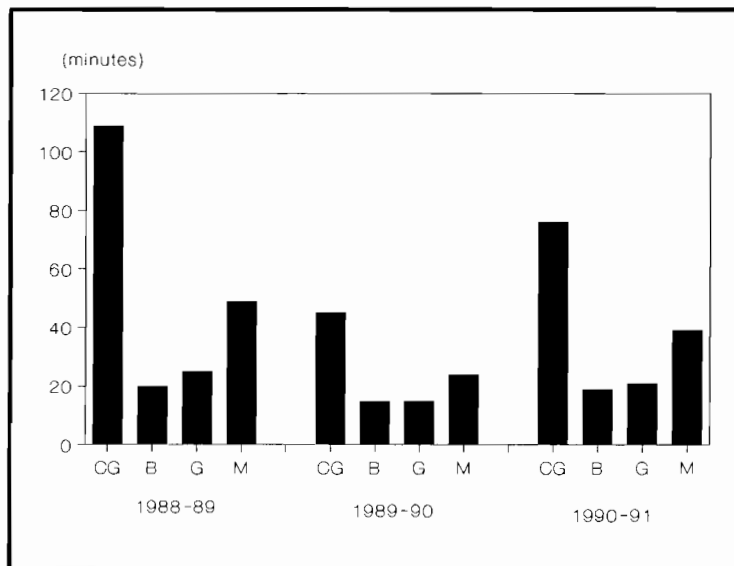
- ▶ a region may have a number of fires going at the one time and it may therefore not be possible to immediately dispatch a crew;
- ▶ fires may be reported at night in inaccessible locations and fire crews must wait until daylight to respond; and
- ▶ certain fires, assessed as low risk, do not require an immediate response.

4.1.20 While these factors may well explain the standard of performance in the 4 regions examined by audit, the Department is not in a position to judge the timeliness of its fire response capabilities across the State until it systematically evaluates the relevant data.

Arrival time measure

4.1.21 An externally derived standard was not available for use in the audit analysis of the *arrival time* measure. However, the analysis did disclose marked variations between the regions in terms of time taken to reach the scenes of fires, as depicted in Chart 4.1C.

CHART 4.1C. AVERAGE TIME ELAPSED BETWEEN DISPATCH OF CREW AND ARRIVAL AT SCENE



CG : Central Gippsland	G : Geelong
B : Bendigo	M : Mildura

4.1.22 Departmental staff indicated that delays in arriving at the scene of fires can be influenced mainly by:

- ▶ fires occurring at distant and inaccessible locations;
- ▶ inaccurate reports of fire locations; and
- ▶ the poor state of tracks which often slow down firefighting teams.

4.1.23 The Department recognises the absolute significance to effective suppression of reaching the location of a fire in the shortest possible time. In this regard, the Department advised audit that the following initiatives have been taken in recent years to ensure optimum placement of firefighting resources across the State:

- ▶ establishing a number of first attack teams equipped to move directly from a work site to anywhere in the State;
- ▶ strategically locating fire bombing aircraft to ensure minimum response time to combat remote fires; and
- ▶ assembling specialist crews which descend from helicopters to commence suppression action, particularly in inaccessible or remote areas, while conventional firefighting crews travel to the fire.

4.1.24 Notwithstanding these initiatives, the results of the audit analysis illustrate that there is scope for improving the effectiveness of the Department's fire suppression procedures. Clearly, if the Department undertook a similar analysis on a regular basis across all regions, it would be much better placed to evaluate its fire suppression performance and reach more informed decisions on related resource requirements.

4.1.25 The Department should widen its performance review framework for fire suppression to include response time, arrival time and other measures to improve strategic decision-making on resource needs and assessments of its periodic effectiveness in suppressing fires.

4.1.26 In line with the Department's public accountability obligations, information on the level of performance achieved in fire suppression should be available on an annual basis for the scrutiny of the Parliament.

RESPONSE provided by Director-General, Department of Conservation and Environment

The Department responds positively to the audit proposals and will further investigate their applicability.

Relevant information is already included in the Department's Annual Report to Parliament.

Use of post-fire debriefings

4.1.27 For many years now, the Department has utilised post-fire debriefings (including special conferences following major fires) as a source of information to assess the effectiveness of its fire extinguishment procedures. The primary aim of such debriefings has been to identify changes necessary in procedures or techniques in order to avoid recurrence of past problems and improve future firefighting capabilities.

4.1.28 In order to gauge the extent to which the Department had effectively utilised debriefing sessions, audit examined the outworkings of a selected number of debriefings over a period of time. **The principal conclusion from this examination was that, although debriefings have been a useful method for identifying and documenting problems encountered in combating bushfires, there was little evidence of resultant remedial action taken by the Department.** In fact, problems of a similar nature were identified during debriefing sessions spanning a number of years and debriefing files contained no record of the outcomes of the proposed corrective actions. Examples of the more important recurring problems were:

- ▶ inadequate provision of training for certain specialised firefighting tasks and for the additional firefighting personnel engaged for the summer period;
- ▶ concerns regarding the reliability and availability of important firefighting equipment;
- ▶ poor communication arrangements; and
- ▶ significant health and safety matters including non-use by fire personnel of standard safety equipment and the involvement in firefighting of personnel with breathing or other health difficulties.

4.1.29 The results of the audit review of post-fire debriefings complement the earlier findings on performance measurement of fire suppression and indicate that the Department's fire suppression activities are not currently managed with optimum effectiveness.

4.1.30 The Department should upgrade its debriefing procedures to ensure that identified problems or opportunities for improved techniques or procedures are acted upon.

RESPONSE provided by Director-General, Department of Conservation and Environment

The comment is endorsed and the activity is regarded as a key result area. Considerable development had been initiated prior to the audit to ensure more effective use of post-fire debriefings, with positive results. Further development of the debriefing process will be pursued.

PART 5

COMMUNICATIONS NETWORK FOR FIREFIGHTING PURPOSES

5.1**COMMUNICATIONS NETWORK FOR
FIREFIGHTING PURPOSES**

5.1.1 The Department of Conservation and Environment operates an extensive State-wide communications network consisting of around 2 000 mobile radio units linked to various base centres, and other equipment such as telephones, facsimile machines and aircraft communication facilities.

5.1.2 Although the network is utilised for various departmental purposes, the absolute importance of speedy and clear communication of information within any emergency operation means that the network forms an intrinsic element of the Department's firefighting activities.

5.1.3 In 1988, the Department commissioned an external consultancy review to assess the adequacy of its communications network. The principal findings of this review were:

- ▶ insufficient planning for expenditure on radio facilities which, coupled with the advanced age of certain equipment, had led to a decline in the reliability and performance of the network;
- ▶ approximately 50 per cent of the radio equipment on the mobile fleet was in excess of 10 years old;
- ▶ the radio network no longer provided the necessary level of service which caused user frustration, lower productivity and increased risk for those employees involved in hazardous duties such as firefighting;
- ▶ responsibility for network planning and management was either inappropriately defined or misunderstood in some areas of the Department; and
- ▶ a high-level of technical development had accelerated the process of obsolescence.

5.1.4 The consultants estimated that between \$6.5 million and \$8 million (at 1988 prices) needed to be allocated to upgrade the entire communications network to an appropriate standard.

5.1.5 Audit found that very limited action had been initiated by the Department since the 1988 review because of the following high-level government activity in the communications area:

- ▶ A Federal Government decision announced in November 1991 to change radio transmission frequencies across Australia by 1998. This development will mean that most of the Department's current radio equipment will become obsolete. **Departmental officers have indicated that the replacement of its equipment by the specified deadline will involve an overall cost to the Government of \$8 million to \$9 million.**

5.1.6 The above developments are likely to lead to the total replacement of the Department's communications network in the long-term. In the meantime, problems with the existing communication facilities, as identified in the 1988 consultancy review, have been tackled primarily on a regional rather than State-wide basis, with management in individual regions pursuing the upgrading of communications in line with locally-assessed funding priorities. Also, there is a degree of uncertainty within the Department on the most appropriate communications strategy to pursue in the short to medium-term.

5.1.7 **Given the importance of communications to its firefighting capabilities, the Department should introduce a more strategic approach to improving its communications network until the relevant State and Federal Government actions are finalised.**

RESPONSE provided by Director-General, Department of Conservation and Environment

Responsibility for communications management has recently been relocated to the Fire Management Branch to provide the essential focus on emergency communications. The Department is working on a bridging strategy to provide co-ordination on communications issues pending a decision on a new system.

PART 6

SCOPE FOR SHARING FIREFIGHTING RESOURCES

6.1**SCOPE FOR SHARING
FIREFIGHTING RESOURCES**

6.1.1 Because of the nature of the Department of Conservation and Environment's fire prevention and suppression responsibilities in the State's protected areas, the Department has informal arrangements in place for seeking the assistance of other bodies or parties in emergency fire situations. This assistance may involve parties such as the Country Fire Authority (CFA), municipalities and the State Emergency Service.

6.1.2 During the course of the review, audit evaluated the extent to which the Department had pursued resource-sharing arrangements with other bodies, particularly in relation to the provision of training, communications services, equipment and the exchange of ideas and trends in firefighting techniques and procedures. Because the CFA is involved in firefighting activities in similar areas of the State, audit focused principally on the extent of the Department's liaison with that Authority.

6.1.3 The Department does have a strategic link with the CFA through representation, via 2 officers, including its Chief Fire Officer, on the CFA's Board of Management. While this membership provides a source of information to the Department on the CFA's strategies and initiatives, it has not led to formal links between the 2 bodies for a structured sharing of resources in areas of common interest.

6.1.4 Audit's overall assessment from the discussions and inquiries held with both bodies on this subject was that, while some limited dialogue has occurred, each organisation has preferred to pursue its separate responsibilities without any major attention to resource sharing.

6.1.5 **While recognising the importance of each body's autonomy, audit feels that opportunities exist for achieving greater levels of efficiency and effectiveness in the management of the State's firefighting resources through more formalised resource-sharing arrangements between the Department and the CFA.**

6.1.6 Some of the areas with the greatest potential for resource-sharing include:

- ▶ *Training* - Currently, the Department conducts its own training courses and develops its own materials; sharing of resources between the 2 bodies is restricted to a limited exchange of course materials and lecturers. While the Department has no specialised training facilities, the CFA has established a major training centre near Ballan and is considering the establishment of smaller training facilities in other areas of the State.

- ▶ *Communications* - The Department and the CFA operate separate communication networks. Also, some difficulties are experienced with communication between the bodies with older equipment due to the use of different radio channels. While government initiatives to standardise communication networks across the State should resolve this issue in the long-term, avenues to improve communications between the 2 bodies in the medium-term need to be explored.
- ▶ *Equipment* - Each organisation uses specialised firefighting equipment appropriate to its particular needs, e.g. the Department makes widespread use of foam to combat fires while the CFA uses mainly water. Cost savings and improved firefighting cohesion between the 2 bodies would be likely if a combined approach was used for the purchase and maintenance of common items of fire equipment.
- ▶ *Research and development* - The sharing of ideas and trends in matters such as research into fire behaviour, effect of fire on the environment, types of protective clothing and the use of aerial incendiary devices all offer enormous potential to ensure that the State remains at the forefront of contemporary developments in firefighting capabilities.

6.1.7 The existing lines of liaison and co-operation between the Department and the CFA should be expanded to ensure that each organisation derives maximum benefit in terms of improved efficiency and effectiveness in the use of firefighting resources.

RESPONSE provided by Director-General, Department of Conservation and Environment

The suggestions made by the audit will be pursued with a view to securing further economies.

The Emergency Management Act provides a framework for co-operation between the Department and the CFA under emergency operations. Liaison meetings are held at all levels before the fire season and otherwise as required. Standing arrangements are in place for the provision of aerial firefighting services with the Department undertaking supply of light and medium helicopter services to the CFA under contract arrangements.

Current discussions at a senior level are aimed at closer co-operation through shared management of incidents using the Australian Inter-Service Management System. Other initiatives including possible sharing of office space centrally and regionally are under review.

PART 7

FIRES INFORMATION RESOURCES AND EQUIPMENT SYSTEM (FIRES)

7.1**FIRES INFORMATION RESOURCES
AND EQUIPMENT SYSTEM (FIRES)**

7.1.1 The Department of Conservation and Environment considers the availability of information concerning its fire management activities of paramount importance. However, for a number of years, the Department's fire reporting system was run on an outdated computer system, the performance of which could no longer be guaranteed, and where manufacturer's assistance and knowledge of the system within the Department were limited. In addition, the system was incompatible with other departmental computer systems and did not provide communication links between Head Office and the regions.

7.1.2 To overcome the abovementioned deficiencies, in 1988, the Department commenced the development of the Fires Information Resources and Equipment System (FIRES) computer system. The system is designed to service the needs of the Minister, the Department and the Director-General. It was envisaged that the system upgrade would allow information to meet national standards and integrate with other emergency information systems within Victoria and interstate.

Implementation and use of the FIRES system by regions

7.1.3 The ability of the Department to achieve the envisaged benefits and efficiency gains from the FIRES system will depend on the extent to which the regions and the Fire Management Branch are able to make effective use of the information contained within the system for the more efficient use of fire management resources.

7.1.4 In order to assess the degree to which regions have accepted and made use of the system, audit, with the assistance of central office staff, conducted an analysis of data input performance by each region at August 1991. The analysis disclosed a marked contrast in the progress made by the various regions. In addition to this lack of progress, audit found that a number of modules of the system had not been kept up-to-date by the regions.

7.1.5 The lack of commitment to the system by some regions has been recognised by the FIRES steering committee and project team. Certain strategies have been implemented by the Department to make regional management more aware of the need to input all required data into the system so that full benefits can be derived from its implementation. These strategies have included:

- ▶ active promotion of the system to regional managers and staff;
- ▶ visits to regional centres by central office staff;
- ▶ provision of additional funds to accelerate data input; and
- ▶ circularisation to all regions of progress on data input.

7.1.6 Audit visits to a number of regions, designed to assess the extent of the use by regions of the FIRES system, indicated that, overall, regional staff had welcomed and accepted the introduction of the system. However, the following matters were brought to audit's attention by departmental personnel:

- ▶ difficulties had been encountered in establishing links with Head Office using the modems supplied to the regions;
- ▶ insufficient computer terminals had been made available, particularly in the more remote work centres, resulting in inadequate access by the centres to the system;
- ▶ specialised training was required for officers and staff, particularly in the use of specific system modules and the extraction of tailor-made or ad hoc reports for particular regional requirements; and
- ▶ improvements were required to the presentation and legibility of certain computer produced reports.

7.1.7 **The lack of satisfactory progress by a substantial number of regions in meeting data input expectations and the failure to update the information on the FIRES system indicated that regions were not convinced of the benefits of the system. Without the full support of the regions, the perceived efficiency gains to be derived from the introduction of the FIRES computer system will not be achieved and the benefits of an enhanced fire management tool will be denied to the Department.**

7.1.8 **In audit opinion, the development and implementation of the FIRES system has been a major achievement by the Department for which it should be commended. The Department now needs to ensure that regions input the relevant information on a timely basis and that the system is efficiently and effectively used as a fire management tool.**

RESPONSE provided by Director-General, Department of Conservation and Environment

Audit began its investigations between seasons when the currency of much of the information was not critical for firefighting purposes. In the period leading up to the fire season, much more data was entered and existing data brought up-to-date. For example, all regions made a commitment to update their emergency contacts in FIRES by 1 December and all but one region met this target.

The Fire Management Branch recently developed a number of analytical tools which will assist in the Branch's capability to analyse fire management performance. These tools include the establishment of firefighting performance trends, patterns of serial arson and fire incidence in plantations.

Lack of compatibility of FIRES system with the Australian Fire Incident Reporting System

7.1.9 The project submission for the development of the FIRES computer system provided that system upgrades should allow for the information to meet national standards and integrate with other emergency information systems within Victoria and interstate.

7.1.10 The Standards Association of Australia has developed the Australian Fire Incident Reporting System (AFIRS) which identifies a set of common data elements relating to fires, together with standard classifications and codes for the collection, on a national basis, of information relating to fires.

7.1.11 Following a detailed consideration of the requirements of the AFIRS standard, the Department decided that to fully comply with the requirements of the standard would require substantial modifications to its systems. Consequently, the Department decided not to meet all the requirements of the standard. This decision is disappointing given that:

- ▶ it will inevitably lead to a lack of integration of the FIRES system with other emergency information systems both intra and interstate;
- ▶ to the extent that it does not meet the AFIRS standard, the system will fail to meet a national standard; and
- ▶ a senior officer of the Department sat on the working party that developed the AFIRS standard, yet the Department decided not to fully comply with the standard.

7.1.12 Given the substantial benefits that can accrue to the Department in the sharing of fire management information which has been aggregated on a common basis, audit is of the opinion that the decision by the Department not to fully meet the AFIRS standard warrants review.

RESPONSE provided by Director-General, Department of Conservation and Environment

The Department will review the decision.

Potential marketability of the FIRES computer system

7.1.13 Prior to developing the FIRES system, the Department made inquiries concerning the existence of similar systems that may have been operational in Australia or overseas. The Department concluded that a similar project had not been previously tackled anywhere in the world.

7.1.14 The development of the FIRES system has resulted in the Department receiving unsolicited interest from a number of external agencies. Audit also found that departmental staff conducted a demonstration of the system's capabilities to members of the Victorian Police Arson Squad.

7.1.15 While the Department has given some consideration to the possibility of marketing the FIRES system to other agencies, definite views on the matter have not been developed. Factors that have contributed to this stance included:

- ▶ marketing of computer systems is not a function of the Department;
- ▶ the system is still in its infancy and in the process of further development;
- ▶ estimates of a possible selling price for the product have not been prepared; and
- ▶ assessments as to the possibility of the system being adapted to the requirements of other agencies have not been carried out.

7.1.16 Notwithstanding the above impediments, audit considers that there is scope for the Department to gain additional revenue by developing a marketing strategy with the aim of selling or licensing the system to other agencies within Victoria, interstate and overseas.

RESPONSE provided by Director-General, Department of Conservation and Environment

Marketing of the FIRES system is currently being investigated.