RAILWAY ACCIDENT

Report on the collision that occurred between the Sydney to Melbourne Express Passenger Train, the "Southern Aurora" and a Melbourne to Albury Goods Train, near Violet Town on 7th February, 1969.

CONTENTS

●

SECTIONS

1	Summary of Accident	1
2	Result of Accident	1
3	Location and Weather Conditions	3
4	Train Crew Information	4
5	Train Information	6
6	Signalling and Safeworking System	8
7	Evidence	9
8	Tests	18
9	Discussion	19
10	Conclusions	21
11	Recommendations	22

APPENDICES

1	General view of collision scene
2	Views of collision
3	List of injured passengers and train crew
4	Views of damaged points at Up end of Violet Town Loop
5	Locality plan of area
6	Plan of Southern Aurora showing train crew positions at impact
7	Details of locomotive fuelling service
8	Comparisons of Hasler Speed Recorder charts
9	Diagram of signalling arrangements Longwood-Benalla Crossing Loops
10	Post-mortem report on Driver Bowden
11	Report on Southern Aurora brake test
12	Departmental medical questionnaires

1. SUMMARY OF ACCIDENT

On 7th February, 1969, at about 7.05 a.m. the Sydney to Melbourne express passenger train, the "Southern Aurora", collided head-on with the 1.25 a.m. (No. 428) Melbourne to Albury goods train on the standard gauge line near Violet Town.

Eight people lost their lives and 117 were injured. Of the latter, 53 were detained in hospital. The Driver of the Southern Aurora, Driver John Bowden, died of cardiac failure some time before the collision.

Train running arrangements provided for the Southern Aurora to cross the goods train at Violet Town crossing loop.

Approaching Violet Town Loop, the Southern Aurora passed an Automatic Signal which displayed a Normal Speed Warning indication; it also passed the Home Arrival Signal which protects the entrance to Violet Town Loop, and was showing a Low Speed Caution indication. The train was travelling near 71 m.p.h. when it passed both these signals.

It then continued through No. 1 Road (main line) of the loop, increasing in speed to about 72 m.p.h. and passed the Home Departure Signal which displayed a Stop indication. At the Melbourne end of the Loop, it forced its way through the points which were set for the goods train to enter No. 2 Road, and continued on at 72 m.p.h. on the single line section between Violet Town Loop and Longwood Loop, which was occupied by the oncoming goods train.

The goods train approaching Violet Town Loop reduced speed about 35 m.p.h. on passing the Automatic Signal prior to the loop. The Signal was displaying a Normal Speed Warning indication. Soon after that, when realising that a collision was inevitable, the Driver applied the air brake and apparently then entered the locomotive engine room. The Fireman said he jumped from the locomotive some 60 ft. before impact.

The collision occurred at railway mileage 104 miles 45 chains from Melbourne near the Dookie Road level crossing close to Violet Town, and blocked both the standard gauge and broad gauge lines. The speed of the Southern Aurora on impact was about 72 m.p.h., and the goods train was travelling at about 30 m.p.h.

In the collision, both locomotives were wrecked, eight Southern Aurora carriages were derailed, three of which were wrecked, and five severely damaged. The three leading vehicles of the goods train were derailed and extensively damaged. Another four wagons were derailed and damaged to a lesser extent. Refer Appendices 1 and 2.

Following impact, a fire, which originated in the wrecked power van, spread to some of the carriages and goods wagons and caused further damage. Train Conductors attempted to extinguish the fire, and within minutes, fire service units from the Country Fire Authority were on the scene and at 8.45 a.m. had the fire under control.

When the Railway Commissioners requested the implementation of the State Disaster Emergency Plan, the Police Department advised this had been done to stage 2 at 7.20 a.m.

The seriously injured were conveyed to hospitals at Mooroopna, Wangaratta, Benalla and Euroa. Minor injury cases were treated at the scene or at the emergency aid centre set up in Violet Town.

Many passengers were transported to Melbourne privately and buses were engaged to convey other passengers to Melbourne where, on arrival, taxis were provided and arrangements made for luggage to be forwarded.

Following removal of the wreckage, the standard gauge track was repaired and the line reopened for traffic at 10.10 p.m. on the day of the accident. The broad gauge line was reopened for traffic at 1.57 a.m. on 8th February, 1969.

2. RESULT OF ACCIDENT

2.1 INJURIES TO PERSONS:

The Southern Aurora had a complement of 184 passengers and 23 crew, the latter consisting of Driver, Fireman, Guard, Conductors (11), Dining and Lounge Carriage Attendants (8), and an Electrician.

The goods train crew consisted of Driver, Fireman and Guard.

Difficulty was experienced in accounting for all the people shown on the passenger list, due to some people who had booked for the journey not joining the train and others being listed under the name of the person who made the bookings.

2.1.1 Fatally Injured :

The following passengers and train crew lost their lives in the accident :

PASSENGERS :	BERTH	CARRIAGE
Mrs. Nora Evelyn Newell, 109 Ash Street, Doveton, Victoria	1	7
Miss Laura Newell, 109 Ash Street, Doveton. Victoria	2	7
Mrs. Kathleen Mary Vider, 10 Wilcocks Street, Mitchelton. Queensland	6	7
Mrs. Mary Josephine King, 58 Randolph Street, Guildford, N.S.W.	12	7
Miss Doris Lily May Reddick, Bannister Street, Nth. Bendigo. Victoria	8	8

TRAIN CREW :

Mr. Laurence Norman Rosevear, 18 Chenerly Street, Wodonga	Driver of the goods train
Mr. Allan Keith Willson, 72 Joseph St., Lidcombe, N.S.W.	Electrician in the Southern Aurora power van
Mr. Frederick Joseph McKenzie, 132 Horsley Road, Panania. N.S.W.	Conductor in Carriage 7.

The Electrician and the Conductor who lost their lives were employed in the New South Wales Government Railways.

The Driver of the Southern Aurora, Mr. John Bowden, 66 Tallangatta Road, Wodonga, died of cardiac failure some time before the collision.

2.1.2 Injured :

As at 14th February, 1969, there were 77 people reported as injured, and since then a further 40 have advised of injuries received, making a total of 117. Of these, 96 were passengers and 21 crew, of whom 53 received hospital treatment. Refer Appendix 3 for details.

2.2 DAMAGE :

After the impact, both locomotives came to rest on their sides approximately opposite each other.

A fire started immediately in the wrecked power van and was fed by diesel fuel from the locomotives. The fire spread to carriages 6 and 7, the Lounge and Dining Carriages, the goods train locomotive and some of its wagons.

The positions in which the locomotives and vehicles came to rest are shown in Appendix 1 and the photos in Appendix 2 (i) and (ii).

Details of the damage are as follows :

2.2.1 Southern Auroa :

LOCOMOTIVE. S. 316 : The locomotive was crushed from the front back to the main transverse members at the leading bogie pivot, roof sections over the generator and engine torn off and the structural members badly damaged. The damage rendered the body beyond repair, but the engine, generators, traction motors and bogies, while damaged, are repairable.

PHN. 2370 : POWER VAN : Completely destroyed.

LAN. 2346 ROOMETTE SLEEPING CARRIAGE (10) : All underfloor equipment was sheared off, the roof, sides, floors and ends badly damaged and the trailing portion of the carriage badly crushed. At the leading end, the whole end of the carriage was bent upwards from the bogie centre, badly buckling the body and roof.

NAM. 2343 TWINETTE SLEEPING CARRIAGE (9) : All underfloor equipment was sheared off, roof, sides, floors and ends were badly damaged. The entire length of the carriage on the corridor side was badly buckled and holed, and the carriage had been compressed in length, causing buckling of the sides and roof in the vicinity of Compartments 5 and 6. The trailing right hand corner was badly crushed.

LAN. 2350 ROOMETTE SLEEPING CARRIAGE (8) : This carriage was penetrated through the side and roof at about the centre by Carriage No. 6 and, as a result, was twisted and very extensively damaged.

NAM. 2339 TWINETTE SLEEPING CARRIAGE (7) : This carriage had its roof torn out, one side folded back and was gutted by fire.

LAN. 2345 ROOMETTE SLEEPING CARRIAGE (6) : All underfloor equipment was sheared off, roof, sides, floors and ends were badly damaged and the interior gutted by fire.

BCS. 2355 LOUNGE CARRIAGE : All underfloor equipment was sheared off, roof, sides floors and ends were damaged. At the leading end one corner was crushed from floor to ceiling. Floor was badly holed and body twisted. This carriage was badly damaged by fire at the kitchen end and in the saloons. Some recovery of interior fittings is possible.

RMS. 2358 DINING CARRIAGE : The carriage, although derailed, was upright with some collision and fire damage, but not serious.

The remaining five carriages and the Brake Van were not derailed and, after some minor repairs, were returned into service.

Carriages Nos. 10, 9, 8, 7, and 6 were considered beyond repair.

During rescue operations, Country Fire Authority personnel reported that in the Dining and Lounge Carriages they were unable to enter by the doorways because of the acidic nature of the atmosphere, and they had to first vent the carriages by breaking the windows.

It seems reasonably certain that the cause arose from some of the refrigerating gas Freon 12 (dichlorodi-fluoromethane) escaping and being decomposed by heat.

The only known reported investigation into the health dangers of the decomposition products of this gas was undertaken by the Ohio State University. The investigation demonstrated that discomfort but no danger could result from a leak of Freon 12 into a habitable room containing a flame.

A major safety factor with the gases given off when Freon 12 is overheated is that they are soluble in water and hence the use of a water spray materially assists in their dispersement.

The Country Fire Authority, the Metropolitan Fire Brigades Board and Railway staff have been informed of the nature of the gas and precautions to be taken.

2.2.2. Goods Train :

LOCOMOTIVE S. 314 : This locomotive was crushed from the front back to the main transverse members at the leading bogie pivot; the rear end was also crushed and all the main longitudinal structural members between bogie pivots were broken or distorted. It was subject to heavy fire damage and was a complete loss, except for some traction motors and minor parts which can be repaired.

DETAILS OF DAMAGE TO VEHICLES :

ALX. 35	Burnt and damaged beyond repair
OX. 23	" " "
SGX. 2	" " "
BKX. 11912	Extensive fire damage and body distortion, but repairable.
ALX. 21	Minor damage
ALX. 31	" "
LLV. 11534	Both ends, doors and body damaged, but repairable.

2.2.3. Permanent Way :

Damage to both the standard gauge and broad gauge tracks extended over a distance of 200 yards, and involved the renewal of 450 yards of rail, 270 sleepers and 300 cubic yards of ballast.

The points at the Melbourne end of Violet Town Loop, and the connecting rods between the points and the electric point machine were damaged as follows :

POINTS : The left hand point blade was bent and had a raised burr on the side which contacts the stock rail, and an abrasion from the blade toe back to where it makes contact with the stock rail.

CONNECTING RODS : The operating rod and the lock rod spreader were bent, as well as the switch extension piece which connects to the toe of the blade. Refer Appendix 4 for photographs.

At the Dookie Road level crossing, a Flashing Light Signal mast was demolished, and some track circuit bonding was damaged.

3. LOCATION AND WEATHER CONDITIONS

3.1 LOCATION :

The accident occurred on straight track at railway mileage 104 miles 45 chains from Melbourne (unless otherwise stated, all mileages refer to railway mileages from Melbourne) which is approximately 78 chains on the Melbourne side of Violet Town Loop, and about 54 chains on the Melbourne side of Violet Town Railway Station.

The standard gauge track is on the south side of the North-Eastern broad gauge line and generally runs parallel to that track. At mileage 105 miles 45 chains, the standard gauge track deviates round Violet Town Station for a distance of 57 chains, until mileage 104 miles 68 chains from where it again runs parallel to the broad gauge track.

Between the Automatic Signal at 108 miles 39 chains and the point of impact, the gradient of the track shows little variation from level, having overall an average falling grade of one in six hundred towards Melbourne. Refer Appendix 5 for locality plan.

3.2 WEATHER :

The weather at the time of the accident was fine and sunny, and visibility was clear.

4. TRAIN CREW INFORMATION

4.1 MEDICAL EXAMINATION PROCEDURE :

The procedure relating to periodical examinations of Drivers and Firemen existing at the time of the collision was for them to be examined as follows :

VISION AND HEARING : Every two years.

PHYSICAL :	Up to 45 years of age	— Every 10 years
	45 to 60 „	— Every 5 years
	Over 60 „	— Annually

or more frequently when considered necessary.

4.2 SOUTHERN AURORA CREW :

DRIVER JOHN BOWDEN was 53 years of age, and he had been employed in the Railway Department for 31 years. He was appointed a Driver in 1951 and a Senior Driver in 1959. Since then, his duties involved driving express passenger and goods trains between Albury and Melbourne.

On 20th June, 1968, Driver Bowden was examined medically and in vision by the Railway Medical Officer and passed fit. The examination showed that the heart and lungs were both clinically normal and that his blood pressure was 170/100. His next periodic examination was due in June, 1970, for vision, and for medical in June, 1973.

His departmental medical history shows that on 21.5.58 his blood pressure was 164/100, and on 24.6.63, 202/110. At this latter examination he was marked "fit, to be re-examined in two months", and on 27.8.63 his blood pressure was 185/104. At a further check on 19.12.63, this was down to 150/100.

On 28.8..63 Doctor Grant of Wodonga wrote to the Railway Medical Officer saying that when Driver Bowden first reported to him his blood pressure was 200/130. He prescribed tablets for blood pressure and put him on a diet, and on 28.8.63 his blood pressure was 160/90, and he had lost 17 lbs. in weight. There was no evidence of the history of any further communication between Doctor Grant and the Railway Medical Officer.

At the inquest, Doctor Grant said he treated Driver Bowden for overweight, hypertension and blood pressure up till 9.10.67. During this period his blood pressure fluctuated considerably, rising significantly on the occasions when he ceased taking the tablets. On 9.10.67, Doctor Grant diagnosed angina pectoris and arranged for an electro-cardiogram to be taken. This confirmed that Driver Bowden was suffering from coronary ischaemia, of which angina pectoris is a symptom. On 17.10.67, he was informed of this and that he could die at any time. He was advised to retire but said he could not for financial reasons. Doctor Grant discussed Bowden's occupation with him and what would happen if he died suddenly at the controls of a locomotive, and was re-assured when told that there was another man in the cabin of the locomotive who was qualified to stop the train in an emergency.

Doctor Grant continued treatment of Driver Bowden for overweight, hypertension, blood pressure and angina pectoris up till his last visit in June, 1968. He was to have returned on 4th July, 1968, but did not do so, and, unless he visited another doctor, he would have been out of his blood pressure and one type of the angina pectoris tablets well before February, 1969. Anginine tablets which were found in Driver Bowden's kitbag can be obtained without a prescription and are for the immediate relief of angina pectoris.

Doctor Ackland, the Department's Chief Medical Officer, stated that, had he known Driver Bowden was taking tablets for angina pectoris, he would have dismissed him from driving entirely.

FIREMAN MERVYN GEORGE COULTHARD is 30 years of age, and he has been employed in the Department for eight years. In 1965 he qualified as a Fireman and, since January, 1968, he has been regular Fireman to Driver Bowden on express passenger and goods trains. He passed a practical examination in the procedure to be followed in stopping a train in the event of his Driver becoming incapacitated. He was last examined by the Railway Medical Officer in November, 1964, and passed fit.

PASSENGER GUARD WILLIAM FREDERICK WYER is 52 years of age and he has been a railway employe for 26 years. He was appointed a Goods Guard in 1953 and, since February, 1957, he has been employed as a Passenger Guard on main line passenger trains. He was last examined by the Railway Medical Officer in September, 1966, and passed fit.

Other staff on the Southern Aurora consisted of a Head Conductor, 10 Conductors, two Cooks, four Waiters, Steward, Bar Attendent and an Electrician. Refer Appendix 6 for train crew positions at impact.

4.2 GOODS TRAIN CREW :

DRIVER LAURENCE NORMAN ROSEVEAR was 30 years of age and he had been employed in the Railway Department for 14 years. In 1966 he was appointed a Driver and, since May, 1967, his duties included driving express goods trains on the standard gauge line between Albury and Melbourne. In August, 1964, Driver Rosevear was medically examined by the Railway Medical Officer and passed fit, and in June, 1968, at his last vision examination, he was passed fit.

FIREMAN ARNFRIED BRENDECKE is 26 years of age and he has been employed in the Railway Department since July, 1968. In August, 1968, he qualified as a Fireman, and in January, 1969, he was authorised to act as Fireman on passenger and express goods trains. He was examined medically and in vision by the Railway Medical Officer in July, 1968, and passed fit.

GOODS GUARD RICHARD JOSEPH HARRIS is 37 years of age and he has been employed in the Railway Department for ten years, the last eight as a Goods Guard. He was passed fit medically in February, 1961, and in vision in June, 1967.

4.3 DUTIES OF A FIREMAN :

The duties of a Fireman on a train in running are laid down in the Department's Instruction Book for Trainee Enginemen, the Book of Rules and Regulations, and special instructions which are issued from time to time.

Trainee Enginemen undergo a period of instruction in the duties, and subsequently are required to pass an examination before being certified as competent to perform the duties of Fireman.

These instructions require the Fireman—

(i) Be entirely subordinate to the Driver and to promptly obey his instructions at all times. (Question 2 : Instruction Book for Trainee Enginemen)

(ii) Have a responsibility in regard to signals and be always on the alert to act on his own responsibility. (Question 3 : Instruction Book for Trainee Enginemen)

(iii) Draw the Driver's attention to anything he considers unsafe; also when approaching level crossings, he must keep a sharp lookout and avoid all unnecessary duties that might distract his attention. (Question 4 : Instruction Book for Trainee Enginemen)

(iv) Whilst the locomotive is in motion, he must operate the locomotive Vigilance Control System by pressing a button located near his seat, for a period of not less than three seconds nor more than five seconds. Before pressing the button, the Fireman must satisfy himself that the Driver is alert. (Question 60: Instruction Book for Trainee Enginemen)

(v) In the event of the Driver becoming incapacitated and the Fireman is required to control the train in emergency, he must shut off the power on the locomotive, apply the air brake to stop the train and carry out the laid-down procedure after the train has stopped. (Regulation 158-(a) : Book of Rules and Regulations.)

(vi) Keep a good look-out for signals when not necessarily otherwise engaged, and he must promptly assure himself that the Driver is aware of the indications exhibited. As far as practicable, the Fireman must be disengaged when approaching or passing a station, signal-box or junction, so that he may keep a good look-out for signals. (Regulation 168-(a), Book of Rules & Regulations).

(vii) When for any cause a signal is discernible before it comes into the Driver's line of vision, he must be on the alert to observe the signal and, as soon as it is discernible, he shall clearly inform the Driver of the indication exhibited. (Regulation 168-(b), Book of Rules & Regulations).

(viii) Frequently during the journey, especially when passing a station or signal box, the Fireman must look back to see that the whole of the train is following in a safe and proper manner. (Regulation 196-(b) : Book of Rules & Regulations).

4.4 DUTIES OF A GUARD :

Before being permitted to act as Guard, an employe must pass an examination on Guard's duties.

Duties performed by a Guard on a train in motion are set out in the Department's Book of Rules and Regulations, the Working Time-table and special instructions issued from time to time. These duties include :

(i) When starting from or approaching stations, or when approaching signals or other places where extra vigilance is required, or when passing signal boxes, the Guard must keep a good look-out, and take any action that may be necessary. He must also keep a good look-out on other parts of the journey when not engaged with other necessary duties. (Regulation 199-(b): Book of Rules and Regulations).

(ii) In the case of necessity, operate the air brake fitted to the Brake Van. He must not, however, apply the air brake except in cases of emergency. (Book of Rules and Regulations : Regulation 199-(c) and Appendix 111, Rule 16).

(iii) On standard gauge trains, compile Guard's Journals en route, entering thereon the times of arrival and departure for each station at the time, how the time at stopping points is spent, as well as particulars of the make-up of the train. (Working Time-table : North-Eastern District).

5. TRAIN INFORMATION

5.1 CONSISTS OF TRAINS :

The Southern Aurora consisted of Locomotive S. 316 and 14 vehicles for a load of 641 tons. The train was marshalled in the following order :

TYPE AND NUMBER	DESCRIPTION	
S. 316	Locomotive	
PHN. 2370	Power Van	
LAN. 2346	Roomette Sleeping Carriage	(10)
NAM 2343	Twinette " "	(9)
LAN. 2350	Roomette " "	(8)
NAM. 2339	Twinette " "	(7)
LAN. 2345	Roomette " "	(6)
BCS. 2355	Lounge Carriage	
RMS. 2358	Dining Carriage	
DAM. 2333	De Luxe Twinette Sleeping Carriage	(5)
LAN. 2351	Roomette Sleeping Carriage	(4)
NAM. 2336	Twinette " "	(3)
LAN. 2354	Roomette " "	(2)
NAM. 2335	Twinette " "	(1)
MHN. 2364	Brake Van	

The 1.25 a.m. (No. 428) goods train consisted of Locomotive S. 314 and 22 vehicles for a load of 854 tons. The train comprised Wagons, Vans and Brake Van, marshalled in the following order :

Locomotive S. 314; ALX. 35; OX. 33; SGX. 2; BKX. 11912; ALX. 21; ALX. 31; LLV. 11534; LLV. 11018; BLX. 26; VLX. 242; VLX. 556; LLV. 9949; SFX. 10; SCE. 14511; VLX. 202; BKX. 11897; ALX. 226; GM. 1425; BDL. 31628; HGM. 4452; BDL. 28619; Brake Van PHG. 11676.

5.2 EXAMINATION PROCEDURE :

5.2.1. Locomotives :

There is a general maintenance and testing procedure for locomotives and these are carried out every 20,000 miles (S and B class) at the South Dynon Locomotive Depot. The maintenance procedure is scheduled according to the mileage logged and classified as A, B, C D E, F, G examinations and a master record for each locomotive is filed at the office of the Superintendent of Locomotive Maintenance, Spencer Street, Melbourne.

In addition to these examinations, service inspections are carried out each time the locomotive is fuelled, normally daily. Refer Appendix 7 for service details.

Prior to the commencement of a train journey, the Driver of the locomotive carries out an inspection of the locomotive and records the result in the Locomotive Log Book.

Should a significant mechanical or electrical fault develop in a locomotive during a train journey, the train is brought to a stop where communication is available, and the train crew informs the Centralised Train Control point accordingly.

5.2.2 The Southern Aurora :

After arrival in Sydney or Melbourne, the Southern Aurora carriages are taken to a stabling point for servicing.

As well as the necessary internal servicing, a general servicing of the safety of the carriages is carried out. This servicing includes checking of, and replacing where necessary, the components of the carriage bogies. drawgear and brake equipment.

Following the servicing and completion of any necessary repairs, the braking system of the train is tested to ensure that it functions correctly. After these tests are conducted satisfactorily, the train is ready for service.

Before the train leaves from either Sydney or Melbourne, a brake test is carried out at the departure platform after the locomotive has been attached to the train.

On arrival at Albury, the carriages are examined for undergear and axle box defects and, after the Victorian locomotive is attached, a brake test is conducted.

5.2.3. Goods Trains :

Vehicles of goods trains running on the standard gauge line are inspected by a Train Examiner before the train leaves Albury or Melbourne. The inspection includes an examination of wagon bogies, drawgear and brake equipment.

When the locomotive is attached to the goods train, the Train Examiner, assisted by the Driver, conducts an air brake test to ensure that the train braking system operates correctly.

After these tests are satisfactorily completed, the Train Examiner informs the Driver that the train is in good running order, then records the information in a log book.

5.3 SPEED RECORDER AND VIGILANCE CONTROL SYSTEM :

5.3.1 Speed Recorder :

Main line diesel-electric locomotives in Victoria are fitted with a Hasler Speed Recorder which consists of a dial calibrated in miles per hour, a time clock and a mileage counter.

This type of speed recorder records :

(i) Speed in m.p.h.
(ii) Time of day in hours and minutes.
(iii) Time travelled and at stop.
(iv) Distance travelled.

The recording chart is of waxed paper graphed with lines at 10 m.p.h. and one minute gradations. The speed and time are marked on the chart by a stylus, and the hour of the day is automatically stamped on the top of the chart. Refer Appendix 8 which shows portion of charts enlarged. This has had additional information plotted on it, such as track gradient and signal positions.

There is provision on the chart for other recordings, and in Victoria this is used for recording the operation of the Vigilance Control System.

Inspection of the Hasler Speed Recorder charts, to ensure that Drivers are obeying speed limits and that the Vigilance Control System is operated at the prescribed intervals, is made in the office of the Superintendent of Locomotive Running, Spencer Street, Melbourne.

5.3.2 Vigilance Control System :

In Victoria, all main line diesel-electric locomotives are fitted with a Vigilance Control System. The System was designed by a Victorian Railways engineer who took out patents, and it has since been adopted with variations by other railway systems. It is pneumatically operated and is manufactured by Westinghouse Brake (Australasia) Pty. Ltd.

GENERAL FEATURES :

The Driver or Fireman must press a push button valve in the cabin at approximately 90 seconds intervals for a period of not less than three seconds nor more than five seconds.

The buttons are so positioned that some physical effort must be performed to reach them. This feature is to assist the operator to maintain alertness.

Should the push button not be pressed before the prescribed interval, an audible blow of air will occur in the cabin and, if the push button is still not pressed, a loud whistle will sound in the cabin after about 25 seconds.

As a substitute, should the Vigilance Control System become defective, there is an emergency push button which must be pressed at intervals not greater than two minutes. There is no associated warning device, but the push button operation is recorded on the Hasler Speed Recorder chart.

The Vigilance Control operating unit is covered and sealed to ensure that it is impossible for the crew to interfere with the operation of the system.

The Driver and Fireman, on boarding a locomotive, must together inspect the seals and record their numbers and conditions in the Vigilance Control Log Book.

Before leaving the depot, or immediately after departure if a crew changeover has been made, the Vigilance Control System must be tested and the vigilance control whistle permitted to blow to establish that the system is functioning correctly.

In the event of a failure of the Vigilance Control System, the Driver must stop the train at the next station or crossing loop and advise Train Control and the Guard, and record the particulars in the Vigilance Control Log Book. After the Driver has received permission, the train may proceed, but he must instruct the Fireman to record in the Locomotive Log Book the name, the time of passing through, the indications of the signals at each succeeding station or crossing loop.

Whilst the locomotive is in motion, the Fireman must operate the Vigilance Control System but, before pressing the button, he must satisfy himself that the Driver is alert. A button is provided on the Driver's side for use by the Driver when the Fireman is otherwise necessarily engaged.

5.4 SOUTHERN AURORA BRAKE VAN :

The Brake Van MHN. 2364 used on the train on 7.2.69 has the Guard's compartment in the centre of the vehicle. The compartment is fitted with side vision mirrors on either side, so located that, when in the viewing position, a view along the train in either direction can be obtained.

The release tap for the operation of the Westinghouse brake is located at about shoulder height on one end wall of the compartment. Above the tap is the pressure gauge which registers the air pressure in the train pipe.

6. SIGNALLING AND SAFEWORKING SYSTEM

6.1 GENERAL DESCRIPTION :

The standard gauge line from Melbourne to Albury is equipped with an Automatic Block Signalling System for single line working.

There are fifteen crossing loops where trains can pass each other, and seven grade crossings where the broad gauge line crosses over the standard gauge line.

The system, commissioned in 1962, was built to the best known British and American standards existing at that time, and still complies with the latest requirements.

In the U.S.A., a Federal Agency, the Interstate Commerce Commission, specifies that, on lines where passenger trains run at speeds 60 m.p.h. or over, block signalling must be provided, and above 80 m.p.h. automatic train control is required.

In Great Britain, the Ministry of Transport requires block signalling on passenger lines. Dealing with Automatic Train Control, the requirements are that equipment of train-stop type must be provided on urban electric railways in tube or tunnel and on their extensions in the open. On important main lines, the Ministry says that an approved form of equipment of Warning type for distant and multi-aspect (colour light) signals is desirable. This is considered necessary in Great Britain to meet conditions of intensive train services and inclement weather.

No other documentary evidence is available on the requirements of the railway systems of other countries, but it is believed that any form of automatic train control is only provided for very high speed, exceptional conditions such as steep grades, predominantly adverse weather conditions or high density rapid transit systems.

The signalling arrangement on the Melbourne-Albury standard gauge line was designed to suit higher speeds than are in operation and is suitable for train running up to 80 m.p.h. The maximum permissable speed of the line is 70 m.p.h. (there is no proposal for speeds above this), and thus the system is well within the Interstate Commerce Commission's requirements.

6.2 SIGNALLING ARRANGEMENTS AND SIGNAL INDICATIONS :

The signalling arrangements for the portion of line Longwood Loop to Benalla Loop, which includes the Violet Town crossing loop, are shown on Appendix 9.

Each single line section between crossing loops is controlled by Home Departure Signals, e.g., Nos. 25/6 at Longwood Loop and 27/4 at Violet Town Loop. A pair of Automatic Signals, ES. 4975 and ES. 5081, in the middle of the single line section permit a second train to follow on from Longwood Loop when the preceding train has passed ES. 5081.

The signalling arrangements at the crossing loops in each direction consists of, e. g., the 'up' direction at Violet Town Loop :

(i) An approach Automatic Signal No. ES. 5774 which can show Stop (one red light over another red light), Normal Speed Warning (yellow light over a red light), Clear Normal Speed (green light over a red light).

(ii) A Home Arrival Signal No. 27/8 which can show Stop (red over red), Low Speed Caution (two red lights over a yellow light), Clear Normal Speed (green over red).

(iii) A Home Departure Signal No. 27/4 for No. 1 Road which can show Stop and Clear Normal Speed.

(iv) A Home Departure Signal No. 27/U4 for No. 2 Road which can show Stop and Clear Medium Speed (red light over a green light).

The main line points at each end of the loop are operated by an electric point machine which sets the points, applies a mechanical lock to a lock rod connection and electrically detects that the point blade is properly closed to the stock rail and locked in position. This system of remote control of an entire section of line is termed Centralised Traffic Control (C.T.C.).

The signalling at the crossing loops is so arranged that, when opposing trains approach a loop and are to cross, a Low Speed Caution indication may be displayed on both the 'up and 'down' Home Arrival Signals at the same time—one train is signalled into No. 1 Road, and the other train into No. 2 Road; this enables a running cross at low speed to be made, and this was the arrangement set up by Train Control on the morning concerned.

6.3 SAFETY CONTROLS AND INTERLOCKING :

The signals are controlled by track circuits which detect the presence of a train on the track, and therefore the signals are automatically controlled to the Stop indication after a train passes.

At each crossing loop and grade crossing, a relay interlocking system is installed which ensures all necessary safety interlocking and controls between signals and points, such as :

(i) Points cannot be operated unless the appropriate signals are showing the Stop indication and fouling tracks are clear.

(ii) Signals cannot show a Proceed indication unless the points are properly set, and opposing and conflicting signals are showing the Stop indication and the track section is clear.

(iii) The 'up' Home Departure Signals, e.g., 27/4 and 27/U4, at Violet Town Loop are electrically controlled by the 'down' Home Departure Signals 25/6 and 25/U6 at Longwood Loop, so that only one of these signals can show a Proceed indication at the one time and, when a train has entered the single line section, the signals controlling the entrance to that section at the opposite end are secured at the Stop position.

6.4 CENTRALISED TRAFFIC CONTROL :

In addition to the safety controls and interlocking previously described, the points and home signals are operated by a Train Controller from a control panel and illuminated track diagram located in the Train Control Section of the Railway Administrative Officers at Spencer Street.

The illuminated track diagram shows the arrangement of track and signals for the entire line, and indicating lights show :

(i) the presence of trains on sections of track;
(ii) the setting of the points;
(iii) the condition of Home Signals, i.e., either Stop or Proceed.

The control panel contains push buttons for operation of points, signals and releases to electric locks.

An automatic train graph is provided on the control panel to record on a time basis the operation of signals at the crossing loops and the passage of trains past each end of the loops, and consists of a roll of graph paper moving at constant speed under recording pens.

7. EVIDENCE

7.1 TRAIN RUNNING ARRANGEMENTS :

At about 6.33 a.m. on the morning of the collision, in the Train Control Room, Spencer Street, Melbourne, Mr. R. A. Humphrey, Acting Senior Train Controller, and Mr. F. J. McDonnell, Train Controller, discussed the crossing of the Southern Aurora (which at that time was travelling between Alumatta Loop and Glenrowan Loop) and the 1.25 a.m. (No. 428) Melbourne to Albury goods train which was standing in No. 2 Road at Longwood Loop.

They decided to despatch the goods train from Longwood Loop and cross it with the Southern Aurora at Violet Town Loop. These arrangements were conveyed to the Driver of the goods train when he spoke to the Train Controller on the telephone from Longwood Loop.

Mr. McDonnell then operated the control panel to allow the departure of the goods train from Longwood Loop while Mr. Humphrey set the points and signals at Violet Town Loop to permit the Southern Aurora to enter No. 1 Road and stop at the Home Departure Signal and for the goods train to enter No. 2 Road of that Loop.

These operations were recorded on the automatic train graph attached to the control panel as having been carried out at 6.36 a.m., and Mr. Humphrey observed from the indications on the illuminated track diagram that points and signals at Violet Town Loop had operated correctly.

At about 7.4 a.m. Mr. McDonnell saw from the light indications on the panel that the Southern Aurora had passed the Home Departure Signal at Stop and run through the points and had entered the Violet Town Loop-Longwood Loop section. He realised that a collision was imminent as the panel showed that the goods train was also in the section. Mr. Humphrey, who had entered the control room at this time, knew that there was nothing they could do to avert the collision and immediately alerted senior officers.

7.2 SIGNALLING EQUIPMENT :

7.2.1. Signal Indications :

The indications which would have been displayed by the signals on the approaches to and at Violet Town Loop for the crossing of the two trains as set up by the Train Control are as follows : Refer Appendix 9 for signal diagram.

SIGNALS OPPOSING SOUTHERN AURORA :

AUTOMATIC SIGNAL No. ES. 5774 AT MILEAGE 108 MILES 39 CHAINS : Normal Speed Warning (yellow light above a red light), which authorises the Driver to pass this signal prepared to stop at the next signal.

'UP' HOME ARRIVAL SIGNAL No. 27/8 AT MILEAGE 106 MILES 14 CHAINS : Low Speed Caution (two red lights above a yellow light), and this indicates that the points are set in the proper position for the Driver to proceed, but does not imply that the line is clear; the Driver when proceeding must be prepared to stop short of any obstruction.

'UP' HOME DEPARTURE SIGNAL NO. 27/4 AT MILEAGE 105 MILES 43 CHAINS NEAR THE MELBOURNE END OF THE LOOP : Stop (one red light above another red light), which indicates that no train must pass this signal while it displays this indication, unless the Driver is specially authorised to do so.

(Fireman Coulthard confirmed that Automatic Signal No. ES 5774 was displaying the Normal Speed Warning indication, and he saw the 'up' Home Arrival Signal displaying two red lights, but was not observing the signal when the yellow light would have been visible to him. He also saw the Home Departure Signal displaying the Stop indication.)

SIGNALS OPPOSING GOODS TRAIN :

AUTOMATIC SIGNAL No. ES 5497 IS SITUATED AT MILEAGE 103 MILES 10 CHAINS, approximately 1 mile 35 chains before the point of collision—Normal Speed Warning.

'DOWN' HOME ARRIVAL SIGNAL No. 27/2 AND THE 'DOWN' HOME DEPARTURE SIGNAL No. 27/U6—Low Speed Caution and Stop indications respectively.

(Both Fireman Brendecke and Guard Harris confirmed the indications of the Automatic Signal ES 5497).

7.2.2. Point Damage :

Mr. R. E. Boucher, Assistant Stationmaster at Violet Town, inspected the points at the Melbourne end of the loop at about 7.40 a.m. and found them lying in the half-open position, and the rods which connect the point blades to the point machine bent.

Electrical Fitter-in-Charge J. G. Dennis, who arrived at the points at approximately 8.10 a.m., confirmed the finding of Mr. Boucher and was of the opinion that the points had been lying for No. 2 Road, and that a train on No. 1 Road travelling towards Melbourne had run through them.

Mr. A. G. Irving, Signal Circuit Engineer, and Mr. W. J. Currie, Signal & Telegraph Supervisor, who arrived later on in the morning, after viewing the damaged equipment, concluded similarly for the following reasons :

(*a*) The operating rod was bent.

(*b*) The lock rod spreader was bent as well as the switch extension piece which connects to the toe of the point blade.

(*c*) The left hand point blade had a raised burr on the side which contacts the stock rail, and a fresh abrasion extending from the blade toe back to where it makes contact with the stock rail. This, he considered, was consistent with the wheels of a train forcing the blade away from the stock rail. Refer Appendix 4 for photographs.

7.2.3 Routine Examination of Signalling Equipment :

On 18.12.68, Electrical Fitter-in-Charge G. Castleton inspected, adjusted and tested the signals and point mechanism at Violet Town Loop. This included the points at the Melbourne end of the loop and the 'up' Home Arrival and Departure Signals. On completion of the work, he certified that all apparatus was in good working condition.

Automatic Signal ES. 5774 was overhauled and tested by Electrical Fitter-in-Charge J. G. Dennis on 7.1.69, and Automatic Signal ES. 5497 received similar attention on 13.1.69. Both signals were certified to be in good working condition on completion of the work.

7.3 SOUTHERN AURORA AND CREW :

SOUTHERN AURORA :

7.3.1 Inspection of Locomotive :

S. 316 was given a general maintenance 'A' examination on 30.1.69 and was found to be in good and efficient running order on completion of tests. The locomotive was refuelled on 4th, 5th and 6th February, 1969, and the full service inspection was carried out on each occasion. On 7.2.69, an inspection of the locomotive was made by Driver Bowden and the result recorded in the Locomotive Log Book and Vigilance Control Log Book.

Mr. L. C. Rolls, Superintendent of Locomotive Maintenance, examined the wrecked locomotives on 7.2.69 after the collision and, because of the extensive damage, he was unable to say that either locomotive was in any way defective immediately prior to the collision. He further stated that, in view of previous tests and as both locomotives had been operating for some hours and travelled about 100 miles each prior to the collision, he felt that the locomotives were operating efficiently before the accident occurred.

The Locomotive Log Book was received from S. 316 and it did not show any defects recorded on the day of the accident. The Hasler Speed Recorder chart was also recovered and, although damaged, it was readable. The Vigilance Control Log Book was recovered too, and it did not show any defects recorded.

The Log Books and Hasler Speed Recorder chart from Locomotive S. 314 were not recovered because of the fire.

7.3.2 Inspection at South Dynon :

The last occasion the carriages which were involved in the collision were examined at the South Dynon Car Sheds, Melbourne, was on 5th February, 1969, and the servicing and tests were carried out satisfactorily.

7.3.3. Inspection at Eveleigh :

On 6.2.69 at Eveleigh, Sydney, the Southern Aurora was examined and necessary repairs attended to by the examining and maintenance staff of the New South Wales Government Railways. The work was performed in accordance with procedure and, when completed, Leading Examiner R. C. Turner inspected the work and found it to be satisfactory.

At Central Station, Sydney, before departure on 6th February, 1969, the train was examined by Car & Wagon Examiner M. R. Bullock and was found to be in good running condition. An air-brake test was conducted, and the brakes applied and released in the correct manner. He handed the Driver a certificate advising that the train was in good order. He observed the train as it departed and noticed nothing abnormal about the running and drawgear components.

7.3.4. Running en route to Albury :

Between Goulburn and Albury, the Southern Aurora was driven by Driver L. R. Tapper of the New South Wales Government Railways. There was nothing unusual about the trip, the train handled in a normal manner; nor was there anything unusual about the operation of the Westinghouse Brake.

7.3.5 Brake Inspection at Albury :

Train Examiner M. D. Madden (Victorian Railways) was on duty at Albury as the Southern Aurora entered the platform; he watched the carriages for defective running and drawgear as they passed. After the train stopped, he moved towards the front of the train, checking the axle boxes and undergear of each vehicle.

Locomotive S. 316 had been attached to the train when he reached the front so, in conjunction with Driver Bowden, he conducted a modified brake test on the train. The brakes applied and released, which indicated that they were functioning correctly.

Train Examiner Madden did not notice anything unusual about Driver Bowden when he spoke to him that morning.

TRAIN CREW :

7.3.6. Chargeman at Wodonga :

On 7.2.69 Night Chargeman R. L. Wegner was on duty at the Locomotive Depot, Wodonga, when Driver Bowden and Fireman Coulthard reported for duty.

He signed them on duty at 4.20 a.m. and both men appeared normal.

7.3.7 Driver J. Bowden :

On 6.2.69, the day before the accident, Driver Bowden had been rostered off duty. He rose at 10 a.m. and stayed at home till late afternoon when he went to get bait for fishing. In the evening he watched television and retired at about 10.15 p.m. There is no evidence that he consumed any intoxicating liquor that day.

On 7th February, 1969, he drove to work in his car and on the way picked up Fireman Coulthard at about 4.15 a.m.

He signed on duty at 4.20 a.m. and took charge of Locomotive S. 316. After carrying out an inspection and recording the results in the log books, he took the locomotive to Albury where it was attached to the Southern Aurora.

The train left Albury at 5.15 a.m. as shown on the Automatic Train Graph. Perusal of the Hasler Speed Recorder chart showed that the trip until approaching Violet Town Loop was normal. Significant reductions in speed below 70 m.p.h. were as follows :

Wodonga Railway Station : Slowed down to comply with 10 m.p.h. indication which was displayed by Special Permanent Way Signals due to placing a sewerage pipe under the line.

Wodonga Loop : Arrived at 5.29 a.m., there nine minutes and crossed an approaching goods train, then departed at 5.38 a.m.

Alumatta Loop-Glenrowan Loop : Reduced speed to 5 m.p.h. in response to Special Permanent Way Signals from 139 m. 12 chains to 138 miles 73 chains on account of track repairs.

Glenrowan Loop-Benalla Loop : Driver Bowden did not exceed the maximum permissible speed of 60 m.p.h. for that section of line.

After passing Baddaginnie, the train speed gradually increased to 70 m.p.h. and, approaching the Automatic Signal ES. 5774, the speed continued to rise.

During the journey, conversation was generally of the remark and comment nature. On one occasion, Driver Bowden discussed with Fireman Coulthard a fishing trip he intended taking in the near future but, apart from this, there was no other significant conversation until approaching Automatic Signal ES. 5774.

Doctor J. H. McNamara, Senior Government Pathologist, performed a post-mortem examination on the body of Driver Bowden on 10th February, 1969, and his report to the Coroner is set out in Appendix 10.

He stated that the cause of death was cardiac failure following coronary atherosclerosis and myocardial degeneration from scarring. He said that Driver Bowden was dead from his cardiac condition prior to the collision, but could not say how long before.

The body of Driver Bowden was found in the wreckage of the Southern Aurora locomotive.

7.3.8 Fireman M. G. Coulthard :

Fireman Coulthard was rostered off duty on 6.2.69. Except for a period of about three hours, he spent the day quietly at home. Around mid-day, he went to an hotel in Wodonga and had lunch where he said he had about six 7-oz. glasses. At about 3 p.m. he returned home where he remained for the rest of the day. In the evening he watched television and retired about 9 p.m. and he said he slept well.

On 7th February, 1969, he signed on duty at 4.20 a.m. and with Driver Bowden went to Locomotive S. 316, the Southern Aurora locomotive for the trip to Melbourne that day.

Fireman Coulthard indicated that, after leaving Albury, the Southern Aurora handled in a normal manner, and there were no unusual incidents up to the time the train was approaching Violet Town Loop. He told of the conversation he had en route with Driver Bowden about a fishing trip.

He stated that he first saw the yellow light of Automatic Signal ES. 5774 when the train was about one mile from the signal, and he said to Driver Bowden : "We're on a caution, looks like a bit of a stop probably for a Caution Order". He also said : "I'll fill the kettle and put it on". To these remarks Driver Bowden replied : "Yes", and some other words which Coulthard couldn't remember.

As the train passed the Automatic Signal, he got up from his seat and sounded the locomotive whistle for the level crossing at 108 miles 33 chains. Then he picked up the kettle and, on looking ahead of the train, saw in the distance two red lights (one above the other) displayed on the 'up' Home Arrival Signal at the entrance to Violet Town Loop, but at that point he could not discern any further indications of the signal. At about this time, he pressed the Vigilance Control System button, then descended into the nose of the locomotive to fill the kettle. Fireman Coulthard informed the Police that at this stage Driver Bowden was seated in the driver's seat in the normal position facing the front of the locomotive. The Hasler Speed Recorder chart shows that the Vigilance Control System was operated approximately one mile past Automatic Signal ES. 5774.;

Fireman Coulthard stated that he was aware that, in accordance with the Rules and Regulations, Firemen must as far as practicable be disengaged when approaching signals and, when asked why he did not comply with this Regulation on this occasion, he replied : "I don't know".

While he was in the nose of the locomotive, he cannot recall having heard the sound of the locomotive whistle, nor did he notice any slackening in the speed of the train.

By the time he returned to the cabin, the Southern Aurora was about three-quarters of the way through No. 1 Road on the loop. As he looked ahead over his shoulder, he saw two red lights, one above the other, shown on the 'up' Home Departure Signal which was only a short distance away.

The last occasion Fireman Coulthard remembered cancelling the Vigilance Control System was when he returned to the cabin after filling the kettle, which about coincided with seeing the two red lights of the Home Departure Signal. He recalled hearing the faint audible blow at this time and he cancelled it.

He told the Police that the last time he operated the Vigilance Control System was prior to leaving the cabin to enter the engine room, which was about when he shouted to Driver Bowden about the oncoming train, but he said he wasn't certain of this.

The Hasler Speed Recorder chart shows that the Vigilance Control System was last operated about when the locomotive was in the vicinity of the Cowslip Street level crossing and on the curve round Violet Town Station.

On seeing the two red lights on the 'up' Home Departure Signal and realising that the signal was indicating Stop and that something was wrong, he shouted "Red Light" to Driver Bowden who didn't reply, but by this time the locomotive was passing the signal. About the same time, he saw in the distance the headlight of an approaching train, but could not determine whether it was travelling on the standard or broad gauge line. He also stated that about this time the thought passed through his mind that Driver Bowden may have dozed off.

When asked if he was aware that, in accordance with the Rules and Regulations he has a responsibility to ensure that the Driver obeys signal indications, he replied : "Yes", and, in reply to a question as to why he took no action when he was aware that the Driver had not obeyed the signals, he said "I don't know".

Fireman Coulthard said he was standing beside the Fireman's seat in the cabin as the Southern Aurora was on the curve round Violet Town Station when he realised that the oncoming train was approaching on the standard gauge line. He shouted to Driver Bowden : "There's a train coming at us", but Bowden didn't reply. He could not recall having looked at Driver Bowden or having seen him make any physical movement at about this time.

He said that, when the locomotive was in the vicinity of the Melbourne end of the Violet Town station platform and still travelling at a fast speed, which he said seemed strange to him, he said to Driver Bowden : "I'm going into the engine room". Although he did so immediately, he could not recall Bowden making any reply to his remark.

The last time Driver Bowden spoke to Fireman Coulthard was apparently when Bowden said : "Yes" as the train approached Automatic Signal ES. 5774. On no occasion after that did Fireman Coulthard hear Driver Bowden reply to anything he said.

After entering the engine room, he said he then heard a crash and lost consciousness. Apart from regaining consciousness for a brief period after the collision, his next recollection is being in hospital.

Fireman Coulthard was asked whether or not he was aware that, in these conditions, he should have taken action to stop the train by closing the throttle and applying the air brake, he said : "Yes", and when asked why he did not do so he replied : "Panicked, I suppose, that's all".

At a later interview, he was asked did he notice any unusual movement or noise when the train went through the points at the Melbourne end of the loop, and he said : "Just a slight bang". Replying to a question as to whether or not this noise indicated anything to him, he replied : "Not really". He was reminded that at that particular time he was aware that the train had passed the Home Departure Signal while it indicated Stop, and he stated that the points could have been in the incorrect position. The Board then asked him : "Wouldn't that have indicated to you that the signals were not against you because of a failure, but were set up for a cross", and he replied : "Yes".

He was again asked why he made no attempt to stop the train and his reply was : "I thought the brakes had applied".

In a statement to the Police, Fireman Coulthard stated that, when he shouted "Red Light" to Driver Bowden near the Melbourne end of the loop, Bowden was seated facing ahead, and, when he sighted the oncoming train, he said Bowden was in his normal driving position facing ahead. He further stated that, to his slight observation, Driver Bowden appeared normal.

Also in his Police statement, he said he thought he heard the brakes being applied but he did not feel any brake application. He told the Police that, when he came out from the locomotive nose and saw that a crash was impending, "he felt alarmed".

Repairer M. J. Muldeary, a railway employe at Violet Town, was standing near the broad gauge track approximately 160 yards on the Melbourne side of the Violet Town Station platform when the Southern Aurora passed on 7.2.69. He said that, as the locomotive passed him, he waved to someone sitting on the right hand side of the locomotive cabin, and that the person waved back.

At the Inquest, Fireman Coulthard stated that Driver Bowden and himself commonly wave to people, but he could not say if either of them waved to anybody as the train passed through Violet Town on 7.2.69.

7.3.9 Guard W. F. Wyer :

On 6th February, 1969, Guard Wyer was Guard on the Melbourne to Sydney express passenger train 'Inter-Capital Daylight' for the Melbourne to Albury part of the journey. He signed off duty at 12.40 p.m. at Albury, and took his personal belongings to "Lancaster Lodge", the guest house where Guards are accommodated when required to stay overnight in Albury.

During the day he visited the main street of Albury and on three occasions he visited an hotel near his accommodation. On two of these occasions, he had lunch and tea. He said he had a couple of glasses of beer each time he went into the hotel. Later in the afternoon he returned to the guest house and had a sleep. In the evening, he watched television at the hotel and about 8.30 p.m. he returned to the guest house. He said it was a hot night and, after showering, he read till near 9.20 p.m. when he went and had some coffee at a cafe. He returned to his accommodation about 10.30 p.m. and went to bed.

Mr. E. J. Parker, Proprietor of "Lancaster Lodge", stated that his records show that Guard Wyer arrived on 6.2.69 and left early on 7.2.69. Although he did not see Guard Wyer on this occasion, there was nothing unusual about his conduct reported to him. He said the conduct of Guard Wyer had never given cause for complaint.

The next day, 7th February, 1969, he reported for duty at 4.50 a.m. at Albury Railway Station. He said he had a conversation with the Assistant Stationmaster in the Station Office, but Mr. J. J. Shaw, Assistant Stationmaster, New South Wales Government Railways, who was on duty at the time, said when interviewed on 25.2.69 that he cannot recall seeing or speaking to the Victorian Railways Guard for the Southern Aurora that day. Mr. Shaw stated that it is his practice to satisify himself that the Victorian Guard reports and that he could recall nothing unusual so far as the day in question is concerned.

When the Southern Aurora arrived in Albury at 5.05 a.m., the Guard from Sydney, Guard A. H. White, N.S.W.G.R., handed over to Guard W. F. Wyer, who was waiting on the platform. Guard White stated that there was nothing unusual about the changeover. He also said they had a short conversation during which he was standing quite close to Guard Wyer and he did not detect any smell of liquor, nor was there anything else about his condition to indicate he might have been drinking. He said that Wyer looked normal to him.

Guard Wyer stated that about 5.12 a.m. the air brake pressure gauge showed the air pressure rise to about 70 lbs. per square inch, which indicated that the Victorian locomotive had been attached to the train.

He stated that, on assuring himself that the train was ready to depart, he exhibited a green light which was acknowledged from the front of the train, and the train left Albury at 5.15 a.m. He recalled the train slowing down at Wodonga Railway Station, but could not recall stopping at Wodonga Loop, nor could he remember viewing any signal indications approaching Wodonga Loop. He further stated that he could not recall the train slowing down during any portion of the journey prior to arriving at Violet Town Loop, except that he thought the train stopped at Benalla to cross another train.

Set out hereunder are the train running times between Albury and Violet Town Loop recorded by Guard Wyer in the Guard's Journal, and as recorded on the Automatic Train Graph in the Train Control, Room, Spencer Street, Melbourne.

LOCATION		GUARD'S JOURNAL		AUTOMATIC TRAIN GRAPH	
Albury	...	Depart	5.15 a.m.	Depart	5.15 a.m.
Wodonga Loop	...	„	5.27 a.m.	Arrive	5.29 a.m.
				Depart	5.38 a.m.
Alumatta Loop	...	„	6.08 a.m.	„	6.17 a.m.
Benalla Loop	...	Arrive	6.34 a.m.	„	6.46 a.m.
		Depart	6.40 a.m.		
Violet Town Loop	...	„	6.58 a.m.	„	7.01 a.m.

The Automatic Train Graph showed the Southern Aurora nine minutes at Wodonga Loop and crossing an approaching goods train. In the Guard's Journal, Guard Wyer showed the Southern Auroa standing for six minutes at Benalla Loop and crossing a goods train. He did not show a stop at Wodonga Loop.

Guard Wyer stated that he made all the entries in the Guard's Journal after the Southern Aurora had left Benalla but before the accident. In respect of the time of 6.58 a.m. opposite Violet Town Loop, he said that this entry was possibly made an hour and a half after the crash. He stated that, as far as he can recall, the entries he made in the Guard's Journal were transcribed from similar entries in his Guard's Train Book.

When informed that in fact the Southern Aurora stopped at Wodonga Loop on 7.2.69 and that it did not stop again until the collision at Violet Town, and of other variations in times, he stated that, although he had no recollection of having fallen asleep, he was unable to account for the differences between his entries and what actually occurred.

He said he was aware that Regulations required him to observe signals and to take any action that might be necessary. Between Albury and Benalla, he said he viewed only "a couple of the signals", but was unable to say at what locations. He could not remember seeing the Home Departure Signal at Benalla Loop, and the next signal he saw was the Home Arrival Signal at Violet Town Loop.

Guard Wyer said that on only one occasion between Benalla Loop and Violet Town Loop did he look through the Guard's viewing apparatus on the Driver's side, and he did not see any of the Automatic Signals in that section. He was unable to say how close the train was to the Home Arrival Signal when he first saw the red lights of that signal through the viewing apparatus. He did not see the yellow light of the Home Arrival Signal and, at the time, he assumed that the front portion of the train had already passed the signal, and this would have returned the signal to the Stop indication.

At this stage, although he estimated the Southern Aurora to be travelling at about 65 to 70 m.p.h., he did not consider that the circumstances warranted taking any action. After seeing the red lights of the Home Arrival Signal, he allowed the viewing apparatus to close for a few seconds, then returned it to the viewing position and had another look. On this occasion, he clearly saw the two red lights of the Home Departure Signal for No. 2 Road of the Loop, and a little while later he was able to observe the indication of the Home Departure Signal for No. 1 Road, which was showing two red lights.

When Guard Wyer saw the two red lights of the Home Departure Signal for No. 1 Road, he was not sure whether this meant that the front portion of the train had passed the signal while it displayed a Proceed indication, thus returning it to Stop, or that the train had passed the signal while it showed a Stop indication. He did not notice the train slacken speed, nor did he feel any application of the brakes up to this time. The thought went through his mind as to whether he should let the train proceed or take some action to stop it.

He said he decided to open the tap of the Air Brake Apparatus located in the Brake Van, which he did slightly then closed it again within a second or two. While operating the Air Brake Apparatus, he did not observe the air pressure gauge, and therefore could not say whether the pressure fell or if it built up again when he closed the tap. He did not notice the train reduce speed nor did he feel any brake application when he operated the tap. A few seconds later, he gently opened the tap again, and is not sure whether or not the tap was fully open before he was thrown about in the Brake Van when the train jolted several times to a very rough stop. He stated that he could recall feeling the start of a brake application while he was opening the tap the second time.

Guard Wyer said it was a fine sunny day with good visibility, and the only explanation he could give for observing only "a couple" of signals between Albury and Violet Town Loop was that : "I must have been dozing from time to time, but I cannot recall doing so, nor can I recall waking up with a start".

7.3.10 Conductors :

Head Conductor L. C. Goodsell (N.S.W.G.R.) stated that he was walking along the corridor in Carriage 5 when he felt what appeared to be an emergency application of the brakes. In a matter of yards, the carriage was severely jolted and seemed to bound forward a few yards before stopping.

Prior to impact, he did not notice any reduction in the speed of the train, or any application of the brakes other than the emergency application he described.

On impact, he was thrown along the corridor of the carriage and finished up on the floor. He was not injured however, and afterwards assisted in rescue operations.

CARRIAGE 1 :

Conductor J. T. Howlett (N.S.W.G.R.) said he was about to step out from the conductor's compartment when he felt what he considered to be an emergency application of the brakes. This was immediately followed by the carriage bumping heavily three or four times, then shuddering to a stop. He attended to his passengers, none of whom were seriously injured, then he went to the front of the train. On the way he saw a man wearing dark-coloured overalls lying on the ground near Carriage 8 with oil all over his face and clothes. He said he saw this man about 10 to 15 minutes after the crash and, as he appeared to be well clear of further danger, he went to the assistance of other people. At the Inquest, Conductor Howlett was not able to identify Fireman Coulthard as the man he saw lying on the ground with diesel oil over him.

CARRIAGE 2 :

Conductor F. J. Jennings (N.S.W.G.R.) was in the vestibule at the rear end of the carriage, and he was fairly sure he felt an application of the brakes. A few seconds later he felt a hard thump underneath the carriage and was then thrown off his feet. He said the carriage seemed to jump forward before stopping. He received minor injuries, but attended to his passengers and then assisted in rescue operations.

CARRIAGE 3 :

Conductor J. B. Harrison (N.S.W.G.R.) stated he was in the conductor's compartment at the rear end of the carriage when he felt the train come to a bumpy stop. He did not feel any application of the brakes before the collision.

CARRIAGE 4 :

Conductor D. J. Freeland (V.R.) said he was entering the conductor's compartment at the rear end of the carriage when the train jolted violently and stopped, then jerked forward a few times before stopping. He was knocked down by the impact and received minor injuries, He checked all the passengers in the carriage, then proceeded to near the front of the train with a fire extinguisher and, with other conductors, attempted to put out the fire. After he had emptied the fire extinguisher, he assisted in the rescuing of passengers. Up to impact, he did not feel any application of the brakes nor any reduction in train speed. Later he went to the Shire Hall in Violet Town and assisted Police to verify passengers.

CARRIAGE 5 :

Conductor J. D. Swadling (N.S.W.G.R.) was in the conductor's compartment at the rear end of the carriage when he felt a sudden bang, followed by a succession of bumps, before the carriage came to a stop. He stated that he did not feel any brake application prior to impact. On impact he was thrown to the floor, and afterwards he helped rescue passengers.

CARRIAGE 6 :

Conductor R. J. Hyatt (V.R.) said he was leaving the conductor's compartment when suddenly there was a terrific jolt and he was thrown along the corridor, landing on his back. He also said that the carriage bumped along for a short distance, then swayed and seemed to jump in the air and came to a stop with a terrific jolt. He attended to his passengers and assisted in rescue work Prior to being thrown off his feet, he did not notice any brake application or any reduction in the speed of the train. Prior to these incidents, he stated that the train had been travelling at a fast speed.

CARRIAGE 7 :

Conductor F. J. McKenzie (N.S.W.G.R.) was on duty in this carriage and lost his life in the accident.

CARRIAGE 8 :

Conductor R. T. Pollard (N.S.W.G.R.) stated he was in the conductor's compartment at the rear of the carriage when suddenly it was severely jolted and seemed to bounce along. The carriage appeared to sway and tip over. At about this time, he said he was rolled along the corridor and, when the carriage came to a stop, he found himself in Berth 7. He did not feel any application of the brakes prior to impact.

CARRIAGE 9 :

Conductor H. J. Allen (V.R.) was in the conductor's compartment when he felt a very heavy jolt and the carriage appeared to go in all directions before coming to a stop in an upright position. He was thrown off his feet by the impact and, although he sustained some injuries, he did what he could for his passengers. He checked them all and none appeared to be seriously injured. He did not feel any application of the brakes nor did he notice any reduction in speed prior to the heavy jolt.

CARRIAGE 10 :

Conductor W. P. Matterson (N.S.W.G.R.) was in the conductor's compartment at the rear end of the carriage and he said the train appeared to be travelling at about 70 m.p.h. when suddenly he heard a loud crunching noise and the carriage seemed to spin through the air. He was thrown about violently and finished up in berth 3. After the carriage came to rest lying on one side, his first recollection was seeing the arm of a woman in Berth 1. She told him her legs were trapped; however, he managed to free her, then he broke a number of windows in order to help and release other passengers.

He said that, prior to the impact, he did not feel any application of the brakes or reduction in the speed of the train.

Injuries sustained by Conductor Matterson included two fractured vertebrae, cut forehead requiring eleven stitches, scalded right arm, severe shock, extensive bruising to the body, and he was taken to hospital.

7.3.11 Drivers Dawe and Manning :

Driver H. J. Dawe was the Driver of the express passenger train "Spirit of Progress" between Albury and Benalla on the morning of the accident.

He stated that the Spirit of Progress was terminated at Benalla owing to the accident at Violet Town. After receiving instructions, he took the locomotive only on to Violet Town, arriving at the scene of the accident at about 9 a.m.

Some time later, he coupled the locomotive to the Brake Van of the Southern Aurora. When the air was connected through the train, he had difficulty in maintaining air pressure in the air brake main reservoir. He could hear air escaping so he made an inspection and noticed that the air brake tap between the Brake Van and the next sleeping carriage was in the open position. He closed the tap and the air pressure in the main reservoir built up. He did not think he entered the Brake Van of the Southern Aurora, but said his Fireman may have.

The rear portion of the Southern Aurora, which consisted of Brake Van, Carriages Nos. 1-5, and Dining Carriage, was then pulled back clear of the Dookie Road level crossing.

He then made an inspection of the carriages and noticed that, in the conductors' compartments of the two rear sleeping carriages, the air brake taps, which are connected to the passenger communication cord system, were in the open position, so he returned them to the closed position. He said that he may have possibly closed the air brake tap in the conductor's compartment of the third sleeping carriage too. All other air brake taps were in order.

Later on he pulled the rear portion of the Southern Aurora back to Violet Town Loop.

In a statement to the Police, Driver Dawe stated that he never at any stage entered the Brake Van of the Southern Aurora. He said he was unable to say who entered as there were a lot of people at the scene. Prior to coupling the locomotive, he did see men in white overalls in the Brake Van.

Driver J. B. Manning was the driver of the "break-down" train from Benalla which arrived at the scene of the accident at about 11.30 a.m. on 7.2.69.

He stated that, when the Spirit of Progress locomotive was coupled to the rear of the Southern Aurora, Driver Dawe told him he had lost air pressure. Driver Manning said he then inspected the carriages of the Southern Aurora and heard air escaping from under the Brake Van. He entered the Brake Van and noticed the air brake tap in the full open position, so he closed it. He then returned to Driver Dawe and informed him what action he had taken. However, Driver Dawe still could not maintain air pressure, so Manning then entered the first sleeping carriage and he heard air escaping in the ceiling of the vestibule. He was required to move the "break-down" train, so he left the carriage without taking any action.

Fireman J. Landman was the fireman on the Spirit of Progress on 7.2.69. He stated that, after the locomotive was coupled to the rear of the Southern Aurora, Driver Dawe had difficulty in maintaining air pressure on the locomotive. He said Driver Dawe left the locomotive and inspected the rear carriages of the train. He saw him enter a couple of carriages and, soon after, the air pressure built up.

Fireman Landman did not leave the locomotive at any time after it had been coupled to the Southern Aurora. He said he was observing Driver Dawe for the whole time he was inspecting the train, and he did not see him or any other person enter the Brake Van.

7.4 GOODS TRAIN AND CREW :

GOODS TRAIN :

7.4.1 Inspection of Locomotive :

S. 314 received a general maintenance 'D' examination on 3rd and 4th February, 1969, and was found to be in good and efficient running condition. The locomotive was refuelled on 5th, 6th and 7th February, 1969, and each time the full service inspection was carried out.

7.4.2 Inspection at South Dynon :

On 7.2.69, at about 1.30 a.m., Train Examiner C. Denny carried out a full brake test on the goods train at South Dynon Yard. This included a check of wagon bogies, drawgear and brake equipment. Locomotive S. 314 was not available at the time; therefore, another locomotive was used in connection with the brake test.

Later, at about 3 a.m., after Locomotive S. 314 was attached to the train, Train Examiner Denny, assisted by Driver Rosevear, conducted a modified brake test on the train. He observed that the brakes operated satisfactorily and, after informing the driver accordingly, he recorded it in his log book.

7.4.3 Chargeman and Sub-Foreman at South Dynon :

Mr. B. W. Titford, Clerk, was in charge of the sign-on sheet at the Locomotive Depot, South Dynon, on 7th February, 1969. He said that at about 12.25 a.m. on 7.2.69 he saw Driver Rosevear and Fireman Brendecke when they signed on for duty. He stated that both men appeared to be in good health and neither showed any signs of having been drinking.

Mr. B. A. Cummins, Engineman Instructor, was on duty as Foreman Marshaller at the fuel point at the Locomotive Depot, South Dynon, on 7th February, 1969. He stated that at about 12.30 a.m. on that day Driver Rosevear enquired about a locomotive for the 1.25 a.m. standard gauge goods train to Albury. He informed Rosevear that he would have to wait about two hours until a locomotive would be available.

On several occasions during the two-hour wait, Mr. Cummins spoke to and was quite close to Driver Rosevear but could not detect any odour of alcohol on him.

He had known Driver Rosevear for a number of years and said that on the morning in question he appeared to be his normal self and in a fit and proper condition to perform his duties.

7.4.4 Driver L. N. Rosevear :

On 6.2.69, the day prior to the accident, Driver Rosevear was the driver on a standard gauge goods train from Albury which arrived in Melbourne at about 4.0 p.m. that day. He signed off duty at 4.20 p.m. the same day at the Locomotive Depot, South Dynon, then went to his parents' home in North Balwyn, arriving there at about 5.50 p.m. He had a meal at about 6.45 p.m. and went to bed immediately after finishing the meal.

He was awakened by his father, Mr. H. A. Rosevear, at about 10.30 p.m. and shortly afterwards he again had a meal. During the meal he had a glass of beer from a bottle of beer his father opened. Later on, Mr. Rosevear drove his son to Surrey Hills Railway Station to enable him to get a train leaving at 11.25 p.m. for Melbourne.

Mr. Rosevear stated that, when he left his son at the station, he was carrying an overnight bag which contained his lunch. He also said he knew his son possessed a small travelling clock and carried a key to the North Balwyn home on a key ring. He further stated that his son Laurence was only a moderate drinker and, to his knowledge, he did not have any alcohol in his bag at the Surrey Hills Railway Station.

Driver Rosevear reported for duty on 7th February, 1969, at 12.20 a.m. at the Locomotive Depot, South Dynon. There was nothing about his movements prior to reporting for duty to suggest that he was in any way unfit to properly perform the duties involved in driving a locomotive.

There was no locomotive available for his train, so he waited at the fuel point office till about 2.30 a.m. when Locomotive S. 314 was made available. He took the locomotive to South Dynon Goods Yard and attached it to the 1.25 a.m. (No. 428) Melbourne to Albury goods train.

The goods train departed South Dynon at 3.18 a.m. and arrived at Wallan Loop at 4.30 a.m. where a stop was made to cross a goods train travelling in the opposite direction. It then left Wallan Loop at 5.00 a.m. and proceeded to Longwood Loop, arriving there at 6.28 a.m. A stop was made to cross an approaching goods train and to enable the guards to change over trains.

Whilst at Longwood Loop, Driver Rosevear spoke to the Train Controller and was informed of the arrangements to cross the Southern Aurora and No. 428 goods train at Violet Town Loop. When he returned to the locomotive, he passed this information on to Fireman Brendecke. At 6.38 a.m. the goods train left Longwood Loop and proceeded towards Violet Town Loop.

The train received Proceed indications from the intermediate Automatic Signals between Longwood Loop and Violet Town Loop up to Automatic Signal ES. 5497, the last Automatic Signal before Violet Town Loop, which displayed a Normal Speed Warning indication. In order to comply with that indication, Rosevear reduced the speed of the train from about 50 m.p.h. to about 35 m.p.h. At that time the goods train was about 1 mile 35 chains from where the collision occurred. The train continued on at about 35 m.p.h. until just prior to the collision; when realising that a collision was inevitable, Driver Rosevear applied the air brake and apparently then entered the locomotive engine room.

At about 10.30 a.m. on the day of the accident, the Police found a badly burned body in the engine room of Locomotive S. 314. The body was found lying on a footway which runs between the engine and the side of the locomotive. Although identification was not possible, the Police, after considering circumstances and facts, later accepted the body to be that of Driver Rosevear.

Mr. R. McClure, Depot Foreman, Locomotive Depot, Wodonga, stated that on 12.2.69, during removal of a side panel from about the centre of the goods train locomotive, a travelling clock and a ring of keys fell to the ground as the panel was removed. They were subsequently identified as belonging to Driver Rosevear.

Mr. A. B. Russell, Senior Medico-Legal Chemist at the Coroner's Court, Melbourne, disclosed at the Inquest that an analysis of a sample of blood from the body of Driver Rosevear showed an alcohol content of 27 milligrams per 100 millilitres, which would have arisen from a minimum consumption of one 7-oz. glass of Victorian beer.

When Doctor J. H. McNamara, Senior Government Pathologist, gave evidence at the Inquest, he stated that the body of Driver Rosevear showed signs of putrefaction or early decomposition, which could have produced the very low figure of one 7-oz. glass. Mr. Russell disagreed with that assumption; however, he did say that the figure may not be as accurate as if it had been a properly obtained sample of blood.

Also at the Inquest, Doctor McNamara agreed with Counsel on behalf of the Victorian Railways Commissioners that the alcohol content finding is consistent with the deceased having consumed no alcohol at all.

7.4.5 Fireman A. Brendecke :

Fireman Brendecke was fireman to Driver Rosevear on the goods train from Albury which arrived in Melbourne at about 4 p.m. on 6.2.69. After signing off duty at 4.20. p.m., he went to the railway hostel in North Melbourne where he was to rest until he recommenced duty. Before retiring, he had a meal at a cafe, then returned to the hostel and went to bed at about 6.0 p.m.

He stated that he did not drink any alcoholic liquor nor is it his custom to do so, as he only has one or two drinks of beer on rare occasions. He did not leave the hostel again until shortly after 11.30 p.m. when he went to work.

On 7th February, 1969, he signed on duty at 12.20 a.m. at the Locomotive Depot, South Dynon. There was nothing about his movements between 4.20 p.m. on 6.2.69 and 12.20 a.m. on 7.2.69 to suggest that he would in any way be unfit to properly perform his duties when he signed on.

Fireman Brendecke stated that, when he reported for duty, Driver Rosevear was already there and that he appeared to be in a normal condition.

He said that, after the goods train left South Dynon, a stop was made at Wallan Loop and another at Longwood Loop where a changeover of guards was made. He told of Driver Rosevear speaking to the Train Controller by telephone while at Longwood Loop and that he received information regarding the Southern Aurora and the goods train (No. 428) crossing at Violet Town Loop.

After leaving Longwood Loop, he said the goods train had a clear run up to Automatic Signal ES. 5497, which is the last Automatic Signal before Violet Town Loop, and the indication shown by that signal was Normal Speed Warning. He said that at this stage the goods train was travelling at about 50 m.p.h. and, when the locomotive was nearing the Automatic Signal, he heard the power shut off and the train started to slow down. He also said that, after passing the Automatic Signal, Driver Rosevear made a service application of the air brake, and the train reduced speed to about 35 m.p.h. He stated that during the trip from Melbourne to Violet Town he did not partake of any alcoholic liquor, nor did he see Driver Rosevear do so either.

Shortly after the goods train had passed the Automatic Signal and rounded a slight curve, Fireman Brendecke saw in the distance the headlight of an approaching train, and, a few moments later, he recognised the train as the Southern Aurora which he considered to be in the vicinity of the Melbourne end of Violet Town Loop.

He stated that at this point Driver Rosevear commented that the Southern Aurora was coming in fairly hard. He did not reply as he thought, and believed that Driver Rosevear thought too, that the Southern Aurora had entered No. 2 Road of the loop. He said neither realised that the Southern Aurora had actually gone past the loop at that stage.

About that time, Fireman Brendecke heard an unusual noise come from the rear of the goods train, and he looked back but saw nothing out of order. His attention was quickly drawn to the front by Driver Rosevear yelling that the Southern Aurora was still coming. As he turned, he saw Driver Rosevear in the act of leaving his seat and making an emergency application of the air brake, and at the same time he was flicking the headlight switch on and off. He said he realised something was wrong by the tone of Driver Rosevear's voice and, on looking ahead, he saw the Southern Aurora coming round the curve past Violet Town Station at a very fast speed.

The crew at this point evacuated the cabin. Fireman Brendecke said that Driver Rosevear went to the cabin door behind the driver's seat, while he opened the side door on the fireman's side and began to climb down the steps. He stated that, as he was doing so, he saw that the door from the cabin to the locomotive engine room was open and the thought flashed through his mind that Driver Rosevear may have entered the engine room for safety. He re-entered the cabin with that intention himself, but he said he looked ahead and saw the Southern Aurora about 60 feet away so he jumped from the locomotive through the cabin door on the fireman's side.

He stated that, as he fell to the ground, he saw the two trains collide, which was followed by an instant explosion and the outbreak of fire.

After the collision, Fireman Brendecke remained conscious and assisted with the removal of injured passengers from the wreckage. Some time later, he collapsed and was taken to hospital.

7.4.6 Guard R. J. Harris :

Guard Harris signed on duty on 7th February, 1969, at 1 a.m. at Wodonga Railway Station. He was guard on an Albury to Melbourne goods train on the standard gauge line, leaving Albury at 3.20 a.m. His instructions were that, when the Albury to Melbourne goods train crossed the Melbourne to Albury 1.25 a.m. goods train (No. 428), he was to change trains and travel back to Albury as guard on the goods train (No. 428).

He said that after leaving Longwood Loop, he was looking out along the train and he observed that the intermediate Automatic Signals showed Proceed indications. He confirmed the indication of Normal Speed Warning displayed by Automatic Signal ES. 5497, and said that, as the train approached that signal, he felt the brakes apply and the train slow down. He estimated the speed of the train to be about 30 m.p.h. after the brake application.

The Normal Speed Warning indication shown by the Automatic Signal indicated to Guard Harris that the goods train was going to enter No. 2 Road, or make a stop at Violet Town Loop. He was about to make an entry in the Guard's Journal when he was thrown against the partition in the Brake Van and sustained a severe blow to his left side and head. On regaining his feet, he looked towards the front of the train and saw clouds of dust rising from what appeared to be a derailment.

He immediately went to the rear of the goods train and, in accordance with regulations, placed detonators on the standard and broad gauge lines to warn any approaching trains that both lines were obstructed. He stayed at the rear of the goods train in compliance with regulations until he was relieved some half an hour later.

Guard Harris stated that he then proceeded to the wreckage area and, from this time onward, he did not appear to have much recollection of what happened. At about 11 a.m. he was conveyed to his home in Wodonga. The next morning he was suffering from shock and was admitted to hospital, where he remained for four days.

8 TESTS

8.1 BRAKE TESTS :

In order to determine what effect the operation of the Guard's emergency brake valve in the Southern Aurora would have on the train, Westinghouse Brake (Australasia) Pty. Ltd. was asked to carry out a series of tests. These were conducted on the Southern Aurora in the South Dynon Car Shed, using a locomotive and carriages considered to give approximately the same reactions as those involved in the collision.

The Company's report on the results is attached as Appendix 11.

It states that, for the conditions thought to exist at the time, viz :

(i) throttle in Notch 8 (full power)
(ii) speed 72 m.p.h.
(iii) driver's brake in the "running" position,

the train would take approximately 3,620 ft. to stop if an emergency brake application were to be made by the Guard. If the driver's brake valve was in "Release" position, then the stopping distance would be 6,730 ft.

The Company's Chief Engineer gave evidence at the Inquest that the stopping distance based on the driver making an emergency brake application at a speed of 72 m.p.h. would be 3,200 ft. This compared closely to the Department's figure of 3,000 feet calculated from information obtained from emergency brake testing. It was also calculated that the stopping distance for a train similar to the goods train when travelling at 35 m.p.h. would be 825 feet, and at 30 m.p.h., 620 feet.

8.2 SIGHTING OF SIGNALS FROM THE BRAKE VAN AND LOCOMOTIVE :

On 19th February, 1969, the Board rode the Brake Van MHN. 2364 on the 'up' Southern Aurora. Weather conditions and visibility were similar to those on the day of the collision.

No difficulty was experienced in viewing the signals from the side viewing mirror, and the distances in advance of them at which the indications could be recognised are shown below for the signals at Violet Town Loop :

Automatic Signal ES. 5774	1 mile
'Up' Home Arrival Signal No. 27/8	72 chains
'Up' Home Departure Signal No. 27/4	42 chains

On 18th February, 1969, the Board viewed the signals from an 'S' class locomotive, again under similar weather conditions and close to the time the Southern Aurora went through Violet Town on the day of the collision. The distances the signals could be viewed at were :

Automatic Signal ES. 5774	45 chains
'Up' Home Arrival Signal No. 27/8	42 chains
'Up' Home Departure Signal No. 27/4	49 chains

8.3 TESTS OF SIGNALS AND SIGNALLING EQUIPMENT AT VIOLET TOWN LOOP :

On the day of the collision, the Board of Inquiry arranged with the standard gauge Train Controller at Spencer Street to set up the signal conditions that were known to exist immediately prior to the collision. The signals for the Southern Aurora, Automatic ES. 5774, Home Arrival No. 27/8 and Home Departure No. 27/4, were then observed and found to be showing the correct indication.

The Board also arranged for detailed testing of the circuits to be done that day, but no fault could be found.

9 DISCUSSION

The decision of MR. HUMPHREY, Acting Senior Train Controller, and MR. McDONNELL, Train Controller, at Spencer Street to cross the Southern Aurora and the goods train at Violet Town Loop was in accordance with good train running practice. If the Southern Aurora had obeyed the signal indications and slowed down, it would have resulted in an ideal running cross between the two trains. If, on the other hand, the goods train had been held at Longwood, there would have been a delay of over 100 minutes to this train and another train at Albury waiting on the locomotive.

There was nothing which the train controllers could have done to avert the collision. When they saw on the control panel that the Southern Aurora had disobeyed the signals and proceeded into the Violet Town Loop-Longwood Loop section, they would have known by the scheduled running time of the goods train for the distance that it was close to Violet Town and there were no signals which could have been operated to stop it.

There was nothing about DRIVER BOWDEN'S activities the day before the accident that would suggest his physical condition might have been affected the next day. On the morning concerned, the evidence of people he met and his actions indicated he was normal and he apparently continued to act normally during the trip till near Violet Town.

He conversed from time to time with Fireman Coulthard and, as described in 8.3.2, the Hasler Speed Recorder chart showed he stopped at Wodonga Loop to cross a train and obeyed a number of speed restrictions that were in force between Albury and Benalla.

The first departure from normal running was about 110 miles 40 chains. Appendix 8 shows the speed chart of the Southern Aurora's run on the day in question compared with a number of previous runs of the Southern Aurora when it either stopped or slowed down at Violet Town Loop. Included is a previous run by Driver Bowden. In each case, Automatic Signal ES. 5774 would have displayed the same indication as on 7th February, 1969, i.e., a Normal Speed Warning, and it can be seen that at about 110 miles 40 chains the drivers started to reduce speed. The exception to this was Driver Bowden on 7th February, when the speed of his train increased rather than decreased.

It was about this point that Fireman Coulthard said he mentioned the signal indication to Driver Bowden, who replied to him: "Yes", and some other words that Coulthard couldn't remember. Fireman Coulthard also said that on no occasion after that did Driver Bowden reply to anything he said.

These facts indicate that at approximately 110 miles 40 chains Driver Bowden was either dead or incapacitated to the extent that he could not control the train.

FIREMAN COULTHARD'S activities the day before the accident should not have affected his physical condition on the day concerned. The Night Chargeman at Wodonga, who signed him on and whose responsibility it is to see that the man is fit for duty, said Coulthard appeared normal.

Coulthard's action in going down into the nose of the locomotive after sighting Automatic Signal BS. 5774 was contrary to Regulation 168–(a), which requires the Fireman as far as practicable to be disengaged when approaching such locations so he can keep a good look-out for signals and assure himself the Driver is aware of the indications. His absence from the cabin at this critical time effectively removed the safeguard that a Fireman's presence and this Regulation are designed to provide. Had he remained in the cabin, he would have had ample time to check why Driver Bowden was not reducing speed as required by the signal indications and to stop the train before it reached the Home Departure Signal. Coulthard had passed a practical examination in the procedure to stop a train if his Driver became incapacitated.

When Fireman Coulthard returned to the cabin and saw the Home Departure Signal at Stop, he said the locomotive was about three-quarters of the way through the loop, which is about 105 miles 50 chains. He had some doubts as to when he last cancelled the Vigilance Control System, but the Hasler Speed Recorder chart records this at approximately 105 miles 20 chains, and he said he cancelled it prior to leaving the cabin to take refuge in the engine room.

The time the train would have taken to travel these 30 chains would have been 19 seconds, and it would have taken another 35 seconds to reach the point of collision 55 chains further on. Thus there was a time interval of some 54 seconds from when Fireman Coulthard first saw the Home Departure Signal at Stop to the time of the collision, a distance of approximately 1 mile and 5 chains.

The tests of Westinghouse Brake (Australasia) Pty. Ltd. showed that this train could have been stopped in 48 chains if an emergency brake application had been made from the locomotive, and it is difficult to understand why Fireman Coulthard did not take this action.

The combined stopping distance of the two trains—the Southern Aurora from a speed of 72 m.p.h. and the goods train from 35 m.p.h. (this latter speed was the estimate given by Fireman Brendecke; Guard Harris thought it was 30 m.p.h. at collision)—is about 60 chains. If Coulthard had applied the brake when he saw the Home Departure Signal at Stop, the two trains would have stopped 25 chains short of each other. Even allowing a few seconds for Coulthard to make up his mind to apply the brake, there would have still been sufficient distance left to avoid a collision.

Fireman Coulthard's explanation was that, before he went into the engine room, he thought he heard the Driver apply the brake, yet it must have been obvious to him during the 35 seconds he was in the engine room that this was not so, as the train increased in speed till shortly before the collision.

There was no evidence about GUARD WYER'S movements on the Thursday which would suggest that he might have been unfit for duty the next morning. Guard White, the N.S.W.G.R. Guard who handed over to Guard Wyer, noticed nothing unusual about him.

Guard Wyer's own evidence made it apparent that he was not carrying out his duties on the trip. He said he only saw two signals between Albury and Violet Town (there are 35 standard gauge signals in this distance), and he recorded times in his Guard's Journal which were seriously at variance with those shown on the Automatic Train Graph in the Control Room at Spencer Street. He showed no stop at Wodonga Loop, when in fact the train was there for nine minutes, and showed a stop at Benalla for six minutes, when no stop was made at all.

Wyer said that the first signal he saw approaching Violet Town Loop was the Home Arrival showing two red lights and he assumed the front portion of the train was already past it, which would automatically cause this indication to be displayed. Had he been keeping a good look-out early enough when approaching this signal as is required of him by Regulation 199-(b), he would then have seen the red light of its indication before the locomotive had passed the signal, and so been immediately alerted to the danger when the train, which was then travelling at 72 m.p.h., did not reduce speed to the usual 15-20 m.p.h. for this signal indication

An emergency brake application by Wyer at this stage would have stopped the train in 55 chains. As the signal indication can be viewed in the Guard's vision mirror up to 72 chains in advance, this would have given him sufficient time to decide to apply the brake and there would have been ample distance for the train to have been stopped clear of the Home Departure Signal, which is a further 50 chains past the Arrival Signal.

As it was, Wyer said he did not consider any action was warranted and, after passing the Home Arrival Signal, he discontinued his observation of signals by releasing the vision mirror for a few seconds, and when he next looked the Home Department Signal was showing two red lights, but again he had left the viewing too late as he was not sure whether the front of the train had passed the signal and so returned it to the Stop position.

The circumstances even as described by Wyer required him to be particularly careful to look for the indication on the Home Departure Signal after his assumption regarding the Home Arrival Signal. Had he done so, he would have picked up the Stop indication which was showing at least some 40 chains in advance. With the train approaching this signal at 71 m.p.h., he should have then had no hesitation in making an emergency brake application, and the train could have been stopped a few chains past the signal.

Wyer's failure to observe the Home Departure Signal early enough led to his indecision as to whether to apply the brake or not, and when he said he thought he finally did open the brake fully it was immediately prior to the collision. At this time, of course, it was completely ineffective.

The Board has doubts as to the accuracy of Guard Wyer's evidence, in view of his admission that he might have been dozing on the trip, his incorrect entries in the Guard's Journal and, considering his experience, the obvious lack of action displayed by him in the circumstances existing at Violet Town.

THE VIGILANCE CONTROL SYSTEM on the Southern Aurora locomotive was functioning normally during the trip and was last cancelled approximately 35 seconds before the collision by Fireman Coulthard. He had also cancelled it some two minutes prior to this last cancellation.

The system had thus proved the alertness of Fireman Coulthard at these two points in time, but it is apparent that he did not comply with the instructions for the operation of the system in that he did not assure himself before making the cancellation that Driver Bowden was also alert. It is evident that Driver Bowden was either dead or incapacitated at these last two cancellations and, had Fireman Coulthard properly checked his Driver, he would have surely noticed his condition, and it would have been a simple matter for him to have stopped the train and avoided the collision.

10. CONCLUSIONS

10.1 The Train Control staff at Spencer Street followed normal procedures in train working and made the correct decision to cross the two trains at Violet Town Loop.

10.2 The signalling system functioned correctly.

10.3 The automatic block signalling system in use on the line is a satisfactory standard of signalling in view of the maximum permissible speed of trains, the density of traffic, the climatic conditions of the State, and the fact that two men are employed on the locomotive. The system complies with standards set by the Interstate Commerce Commission U.S.A. and the Ministry of Transport, Great Britain.

10.4 There was no fault in the mechanical condition of the two trains or their locomotives.

10.5 The Drivers, Firemen and Guards were properly qualified and, with the exception of Driver Bowden, were fit to perform their duties.

Driver Bowden, Driver of the Southern Aurora, was suffering from coronary disease causing cardiac ischaemia and was unfit to drive a locomotive.

10.6 The Vigilance Control System functioned correctly during the trip. It was effective in that it obtained Fireman Coulthard's acknowledgement of it, particularly in the critical period before the collision. However, Fireman Coulthard failed before acknowledgement to properly check that Driver Bowden was alert. Had he done so and taken emergency action to stop the train when he saw the condition of Driver Bowden, the accident would not have occurred.

10.7 The Southern Aurora, which was signalled to stop at Violet Town Loop, passed three signals at 71 m.p.h., ran through the points which were set against it at the Melbourne end of the loop, continued on into the section and collided with the goods train at a speed of 72 m.p.h. The three signals and the indications they were displaying are :

AUTOMATIC SIGNAL No. ES. 5774—located 3 miles 74 chains from the point of collision. It was displaying a Normal Speed Warning indication authorising the Driver to pass prepared to stop at the next signal.

'UP' HOME ARRIVAL SIGNAL No. 27/8—located 1 mile 48 chains from point of collision was displaying a Low Speed Caution indication authorising the Driver to pass but to travel at a speed which would enable him to stop short of any obstruction.

'UP' HOME DEPARTURE SIGNAL No. 27/4—located 78 chains from the collision point was displaying a Stop indication.

DRIVER J. BOWDEN died of a coronary occlusion with cardiac arrest prior to the collision. It is probable that he was either dead or incapacitated due to the heart attack about two miles on the 'down' side of Automatic Signal No. ES. 5774, or six miles from the point of collision.

FIREMAN M. G. COULTHARD could have stopped the train and avoided the collision if he had carried out his duties in accordance with instructions. He is at fault in that :

(i) he failed to keep himself disengaged when approaching signals at Violet Town Loop;

(ii) he failed to keep a good look-out for the signals at Violet Town Loop;

(iii) he failed to keep a sharp look-out when approaching and passing over a level crossing;

(iv) he failed to take action to stop the train when it became apparent that the Driver was not obeying the signal indications;

(v) he failed to operate the Vigilance Control System in accordance with instructions in that he did not, before pressing the Vigilance Control button, ensure that Driver Bowden was alert.

PASSENGER GUARD W. F. WYER could also have stopped the train in time to avoid the collision, or at the worst greatly reduced the severity of it, had he performed his duties in accordance with instructions.

He is at fault in that :

(i) he failed to keep a good look-out when approaching the fixed signals between Albury and Violet Town Loop;

(ii) he failed to properly observe the signals at Violet Town Loop and take action to stop the train when it was apparent that the Driver was not obeying the signal indications displayed;

(iii) he failed to correctly compile the Guard's Journal en route, and he made incorrect entries in that journal.

10.8 The Driver, Fireman and Guard of the goods train No. 428 took all possible action to avoid the collision in the time available, and were not culpable in any way.

10.9 It is possible that Driver Bowden's cardiac condition might have been diagnosed by the Railway Medical Officer if—

(i) the periodical examinations had been conducted at more frequent intervals;

(ii) it had been obligatory on Driver Bowden to supply information as to his known medical condition;

(iii) the results of the electro-cardiogram test were known to the Railway Medical Officer.

It certainly would have been diagnosed if Doctor Grant's knowledge of Driver Bowden's condition had been made known to the Railway Medical Officer.

10.10 The signals can be viewed satisfactorily from the side vision mirror in the MHN type Brake Van.

10.11 Some inaccurate details in the passenger list on the Southern Aurora caused difficulty in accounting for some passengers.

10.12 The irritant smoke noticed in the Dining and Lounge Carriages was created by heat decomposing the refrigerant gas Freon 12 which was escaping from the air-conditioning units. The smoke, while causing discomfort, is not necessarily dangerous and is readily soluble in water. The use of a water spray materially assists in its dispersement.

10.13 There were three men on the train, the Driver, Fireman and Guard, each of whom was responsible for the observance of signals and for taking action to stop the train in an emergency. Each had the facility to do this. The accident was caused by the failure of both Fireman Coulthard and Guard Wyer to carry out their duties when Driver Bowden did not respond to the indications displayed by the signals.

11. RECOMMENDATIONS

11.1 Compliance with Rules and Regulations and other Instructions issued from time to time.

11.2 (i) That a review be made of the time interval between periodical Departmental medical examinations of Enginemen, and of procedures followed at such examinations.

(ii) That enginemen be required to inform the Department of the nature of, and reason for, any medical attention they may be receiving.

11.3 That the Vigilance Control System be modified to ensure that both the Driver and the Fireman are fully alert all the time that the locomotive is in motion without having to rely entirely on the human element. The modification should also incorporate a penalty application of the air brake if either or both of the locomotive crew fail to acknowledge the audible warning.

11.4 That steps be taken towards obtaining a more detailed and accurate record of passengers being conveyed, particularly with regard to the names, ages and sex of children, not currently accounted for on sleeping berth diagrams.

11.5 That disciplinary action be taken against Fireman M. G. Coulthard and Passenger Guard W. F. Wyer.

In regard to the foregoing, the Commissioners have already taken the following action :

(i) Reduced the time interval between periodical physical examinations of Enginemen as below :

Firemen and Trainee Enginemen :	Maximum interval 4 years
Driving Staff :	Up to age 59 : Maximum interval 2 years
" "	Over age 59 : Maximum interval 1 year

(ii) Authorised the purchase of an electro-cardiograph machine and arranged investigation of the most appropriate means of obtaining electro-cardiograph tests (and interpretations) of train crews when they are being physically examined.

(iii) Arranged for Enginemen to answer questionnaires on a regular basis, seeking information as to whether they are taking tablets, medicines or injections prescribed by a doctor. A questionnaire was circulated to all Drivers and Firemen soon after the accident. Refer Appendix 12 (i), (ii) and (iii).

(iv) Arranged for a modification of the Vigilance Control System in such a manner that the Driver is compelled to regularly acknowledge a warning in the cabin. The Fireman's duties with regard to Vigilance Control acknowledgement remain unaltered. However, the Fireman cannot acknowledge until the Driver first acknowledges his warning. If either of the crew members fail to acknowledge their vigilance duties, a simultaneous cut-off of engine power and an emergency application of the train brakes will occur. This modification is a radical departure from existing Vigilance Control Systems in operation elsewhere in that it requires both members of the crew to participate. It would have prevented the collision that occurred at Violet Town.
A locomotive has been fitted with the modified system and is undergoing field tests.

(v) Arranged for a more accurate and detailed record to be kept of train passengers.

V. R. Print—1149—69