



**NO 94-125**

**TRAIN 776**

**TRACK WARRANT CONTROL IRREGULARITY**

**CLAVERLEY-OARO**

**31 OCTOBER 1994**

### **ABSTRACT**

On 31 October 1994 the Locomotive Engineer on Train 776, a northbound express freight operated by New Zealand Rail Limited (NZRL) advised Train Control that he was at Oaro, and in response to the question from the Train Control Officer, cancelled the track warrant he held to Oaro. A southbound passenger train, Train 701, arrived at Oaro to cross 776, but 776 was not there. Subsequently it was discovered that 776 was at Claverley, some 12 kilometres south of Oaro. A track warrant was issued for 701 to continue southwards. When the planned crew changeover occurred at Claverley, the Locomotive Engineer who moved from 701 to 776 discovered that the track warrant for 776 to travel to Oaro had not been cancelled as required by NZRL rules. The safety deficiencies addressed in this report are fitness for duty; the auditing of the compliance with rules and procedures by operating staff and the working conditions of Train Control Officers; the relief of staff involved in operating irregularities; and the resilience of the Track Warrant Control system on NZRL.

# TRANSPORT ACCIDENT INVESTIGATION COMMISSION

## RAIL OCCURRENCE REPORT NO. 94-125

<b>Train Type and Number:</b>	Christchurch - Picton Express Freight, 776
<b>Date and Time:</b>	31 October 1994, 1526 hours
<b>Location:</b>	Claverley, 157.98 km, Main North Line
<b>Type of Occurrence:</b>	Track Warrant Control Irregularity
<b>Persons on Board:</b>	Crew: 1
<b>Injuries:</b>	Crew: Nil
<b>Nature of Damage:</b>	Nil
<b>Information Sources:</b>	Transport Accident Investigation Commission field investigation
<b>Investigator in Charge:</b>	Mr W J D Guest/Mr R E Howe

## 1. NARRATIVE

- 1.1 On 31 October 1994, Train 776 was a northbound express freight travelling from Christchurch to Picton. At Belfast, the Locomotive Engineer (No 1) was issued with a Track Warrant, designated as No. 11, to proceed to Oaro where he was to enter the loop and cross the southbound "Coastal Pacific" express passenger train, 701.
- 1.2 The Locomotive Engineers of 776 and 701 would also change over when they met, and return to their home stations.
- 1.3 The Locomotive Engineer (No 2) of 701 had a Track Warrant to travel from Vernon to Oaro, where he was to berth on the main line and cross 776.
- 1.4 At 1526 hours, the Locomotive Engineer (LE) (No 1) of 776 called Christchurch Train Control on the radio, and advised the Train Control Officer (TCO) that he was in the loop at Oaro. The TCO asked if he wished to cancel his Track Warrant, to which LE (No 1) responded by giving the time and the Warrant number, in accordance with the correct procedure. (A transcript of the radio transmissions considered to be relevant is included in this report as Appendix A. All transmissions to and from other trains, track staff, and telecommunications technicians have been deleted.)
- 1.5 Track Warrants are recorded in Train Control in a computer. The programme will not enable two Track Warrants for the same section of track to be issued at the same time. It is essential that a Track Warrant is cancelled correctly before another can be issued. Upon receipt of the time and number of the Track Warrant from the LE (No 1) of 776, the TCO cancelled the Warrant in the computer.
- 1.6 At 1609 hours, southbound 701 departed Kaikoura, and reported this fact to the TCO. At 1633 hours, 701 arrived at Oaro. LE (No 2) expected to see 776, but could not, and asked the TCO where 776 was. The TCO informed him that he believed that 776 was in the loop at Oaro, and when this was denied, he called the LE (No 1) of 776.
- 1.7 The LE (No 1) of 776 advised that he was at Claverley (approximately 12 kilometres south of Oaro), and said that he had tried to tell the TCO earlier that he would be stopping at Claverley. The TCO asked for and received confirmation that 776 was in the loop at Claverley.
- 1.8 The TCO did not have access to the tape recording of conversations in the Train Control Office but could confirm from the train control diagram the time and place of the cancellation of Track Warrant 11. He was surprised to find that 776 was at Claverley. He decided that he should give a high priority to keeping 701 moving so that passengers were not inconvenienced. He had ascertained that 776 was in the loop at Claverley, and he had no reason to believe that this train would move from there without further instructions. Track Warrant 11 had been cancelled in the computer, and a warrant could therefore be issued for the Oaro to Belfast section once all other trains were clear of the section.
- 1.9 The TCO then issued Track Warrant 18 to the LE of 701, from Oaro to Belfast. In dictating the warrant over the radio to the LE, he included an instruction to call Train Control at Tormore and Waipara, and also included the statement in clause 12 "776 may be in the loop at Claverley". The latter is the standard format statement normally generated by the Track Warrant Assisted Computer System (TWACS) and does not necessarily imply uncertainty as to the location of 776.

- 1.10 LE (No 2) of 701 repeated the warrant back correctly. In accordance with NZRL procedures, the time was confirmed as 1641 hours. (Note that in the transcript the time for this exchange is given as 16:39:40 i.e. 1639 hours and 40 seconds. The reason for the discrepancy is that the main clock in the Train Control Office was slightly ahead of the time in the tape recorder. The difference has no significance in this report.)
- 1.11 LE (No 2) of 701 then asked “What the hell’s going on here?” The TCO assumed that LE (No 2) was referring to the change of location of the crossing with 776, and the delay in issuing the Track Warrant to travel to Belfast. He responded with a garbled message about the problems he had had with communications difficulties that afternoon. LE (No 2) acknowledged the reply but made no further comment.
- 1.12 Shortly after 1643 hours the LE (No 2) of 701 confirmed that his train was clear of Oaro.
- 1.13 Five minutes later (at 16:48:14 on the transcript), the TCO asked the LE (No 2) of 701 to give him a call when he was clear of Claverley. He gave no reason for this request over the radio. This request referred to the train and not LE (No 2) and was therefore directed at LE (No 1) following crew changeover at Claverley. Track Warrant 18 was endorsed accordingly by LE (No 2) and LE (No 1) later made the call.

**At this stage the crew changeover occurred at Claverley at approximately 1650 hours.**

- 1.14 At 1654 hours the TCO received a call from the LE (No 2) of 776. This LE had been on 701, but had changed trains at Claverley, and was now due to return northwards to his home station. He asked whether he could get another warrant or have the previous one reissued. The TCO said that he was waiting for 701 to clear (i.e. report clear of Claverley). LE (No 2) then asked if the TCO wanted him to head through to Oaro. The TCO replied firmly, telling LE (No 2) that he was to stay in the loop “until 701 clears Claverley”. LE (No 2) replied that the warrant in 776 had not been cancelled, and was to Oaro.
- 1.15 LE (No 1) of 701 called TCO at 1655 hours and reported clear of Claverley. The TCO then asked if he was clear of Oaro. As Oaro is north of Claverley, and LE (No 2) had already made this report, this was an unnecessary question and indicates the TCO may have been becoming confused by the unusual sequence of events. (This is further indicated in the TCO’s transmission at 1657 hours when he referred to Claverley instead of Oaro.) A confused exchange between the TCO and LE (No 1) now on 701 ensued over the status of Track Warrant 11. During this exchange, when asked to confirm the cancellation of Track Warrant 11, LE (No 1) said “no, I didn’t cancel it”. LE (No 1) said that he stopped at Claverley because he thought that he had had a fire in his locomotive. (He said later that he had smelt fumes and smoke at some stage before reaching Claverley.)
- 1.16 The TCO now realised that a breach of Track Warrant Control procedures had probably occurred, and reported the matter to NZRL’s Network Control Office in Wellington.
- 1.17 The Network Control Manager on duty considered the issues as reported to him and consulted senior management staff. NZRL’s standard procedure when an irregularity in signalling or train control procedures occurs is to relieve the persons involved until the circumstances are fully investigated. He was able to call out a replacement for the TCO, but only had one LE available. Arrangements were made to talk to LE (No 1), now on 701 over the cellular telephone carried by the Train Manager, but after doing so, it was felt that there was no valid reason for delaying the passenger train while a replacement LE was sent out. Instead, the available relief LE was used to replace LE (No 2) now on 776.

- 1.18 The Network Control Manager reported the incident to the Transport Accident Investigation Commission because of the possibility that a collision could have occurred if LE (No 1) on 776 had moved his train from Claverley on the strength of the apparently uncanceled warrant 11, during the period that 701 was travelling south from Oaro towards Claverley.
- 1.19 Although LE (No 1) was interviewed on the arrival of 701 into Christchurch it was not until the next afternoon that a senior manager of NZRL replayed the Train Control tape, which confirmed that the LE of 776 had wrongly told the TCO that he was at Oaro, and cancelled Track Warrant 11. The involvement of LE (No 1) in the irregularity was only now realised by NZRL. LE (No 1) was relieved of duties at approximately 1600 hours the day following the incident.

## Analysis

- 1.20 The concern that was felt by the TCO and the Network Control Manager was the possibility that there were two valid warrants, or at least two warrants perceived as valid by the respective LEs, for travel between Claverley and Oaro. This raised the possibility of conflicting train movements potentially leading to a collision. Their concern was heightened by the fact that 701 was a passenger train.
- 1.21 NZRL's Track Warrant Control Regulations, Rule 6(a) requires:
- “The addressee must report to Train Control when he has cleared the main line within the limits of the track warrant. Once the addressee has reported clear of the limits he must not again act on the authority of that track warrant”
- 1.22 LE (No 1) of 776 did report clear of the main line, but he gave the wrong location, and cancelled the warrant. While he was “within the limits” of the warrant, he now had no valid authority to proceed to Oaro.
- 1.23 An irregularity then occurred concerning Rule 6(c), which reads:
- “The word “Cancelled” must be written across the track warrant when either:
- (i) The addressee has reported clear of the limits; or
  - (ii) The track warrant has been cancelled by a further track warrant.”
- 1.24 From the TCO's perspective, he had received a report that 776 was clear of the limits (i.e. in the loop at Oaro) and correctly asked (No 1) if he wished to cancel his warrant which he did. However, the LE (No 1) of 776 did not write “cancelled” on his copy of the warrant, and it was apparently valid to LE (No 2) of 701 when he changed over into 776 and found it in the cab.
- 1.25 LE (No 1) of 776 stated that he had no intention of moving the train from the loop at Claverley. He believed that he had told the TCO that he was in fact at Claverley, and he knew that a passenger train was approaching.
- 1.26 The TCO did not consider that there was a possibility of a collision. He had checked that 776 was in the loop at Claverley, and while he may have been puzzled about the cancellation of Track Warrant 11, he had no reason to believe that 776 would move back on to the main line. Rule 6(a) forbade such a movement.
- 1.27 LE (No 2) of 701 advised the TCO that 776 was not at Oaro, and was then issued with a warrant to travel south, with the advice that “776 may be in the loop at Claverley”. It was not until he

discovered the uncanceled warrant at approximately 1654 hours that he realised that a potentially serious irregularity may have occurred.

1.28 However, two opportunities for earlier action were missed:

When LE (No 1) of 776 advised that he was at Claverley at 1634 hours, the TCO should have realised that as the Track Warrant had extended to Oaro, and the computer was recording the location of 776 as being at Oaro, there was already an aberration in control procedures. Further immediate enquiries and referral to Network Control Centre would have been well-advised.

When LE (No 2) of 701 asked the vague question “What the hell’s going on here?” at 1640 hours the response of the TCO did not apparently encourage LE (No 2) to make any observation that might have helped to clarify the situation. If LE (No 2) had perhaps phrased his question more precisely, or the TCO had asked what LE (No 2) meant specifically, more light might have been thrown on the situation.

1.29 The origin of the irregularities was the erroneous advice from the LE (No 1) of 776 that he was at Oaro, when in fact he was at Claverley. When interviewed, LE (No 1) could not explain the aberration. The stations are quite different in appearance, and he was very familiar with the route. (See Figs 1 and 2 for photographs of the two locations). The station name is on the Warning Board and the Relay Panel.

### **Medical Aspects**

1.30 The TCO was in good general health. He was not fatigued, and there was nothing unusual in his life or work patterns at the time of the incident. However, on the day of the incident, he was on the first day of a course of an antibiotic prescribed for a chest infection which had been causing him bronchitis. There is a possibility that either the antibiotic, or the condition for which it was prescribed, could have impaired the TCO’s concentration and ability to interpret the events as they occurred.

1.31 LE (No 1) from 776 stated that he considered his health to be “fine”. However, he was suffering from constricted nasal passages, and was waiting for an operation to ease his breathing. He was using a nasal spray, and when questioned, admitted that he used it more frequently than prescribed to give him some relief. Although the spray is not generally known to have side-effects the effect of LE (No 1)’s over-use and the possibility of side-effects cannot be ruled out.

1.32 The effect of constricted breathing on sleeping patterns could potentially be more significant than the nasal spray. The LE said that he usually woke up at least four times every night to clear his nose. The effects of interrupted sleep on human performance can include loss of concentration and impaired judgment.

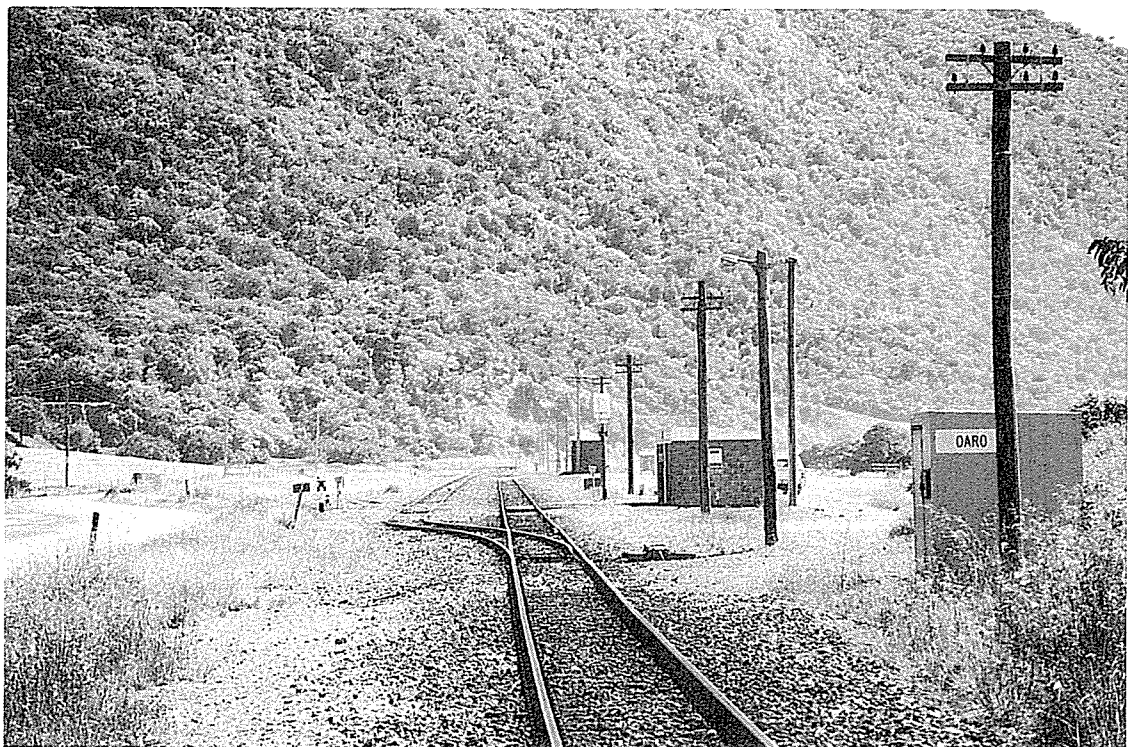
1.33 LE (No 1)’s sleep the previous night had also been interrupted for other than medical reasons. He went to bed about 0130, but was wakened by a telephone call at 0245 hours from a friend who had had a motorcycle accident and needed some help. LE (No 1) went to his friend’s assistance, but did not return to bed until approximately 0500 hours. He then rose between 0930 and 1000 hours, before booking on duty at NZRL at 1125 hours.

1.34 LE (No 1)’s previous shift had been from midnight on Friday until 0900 on Saturday morning. He could not recall whether he had a rest during the day on Saturday, but went to bed late on Saturday night and rose late on Sunday morning.

1.35 There were two other matters that may have affected LE (No 1)’s performance:



**Fig 1: Claverley Station**



**Fig 2: Oaro Station**

His father had died about seven weeks earlier, and his elderly mother was very distressed. He was worried about her.

His concerns about the fumes and smoke that he felt were coming from the locomotive were heightened by an incident he said had occurred some four months earlier when a locomotive on the train he was driving developed an electrical fault and caught fire. The toxic smoke had made him vomit, and feel very ill.

NZRL could find no record of the earlier incident. The repair book for train 776 had the 31/10/94 smoke and heat problem logged but no evidence or fault was found when the repair was marked off at a later date.

- 1.36 The LE was medically fit to NZRL standards. He was generally fit and well, but the combination of sleep deprivation and stress may have affected his judgment by the time of the incident. He did not know why he told the TCO that he was at Oaro.

### **Locomotive Event Recorder Data From Train 776**

- 1.37 The data from the locomotive event recorder speed data was recovered after the incident. The data consisted of speeds recorded every 10 seconds during the entire journey from Christchurch. The Investigator in Charge (IIC) multiplied the speeds by the time intervals to obtain distances, and added these to determine locations. The results gave a plot of speed against location along the route.
- 1.38 It was clear from this plot that LE (No 1) had operated the train prudently and correctly during the trip from Christchurch. The train did not travel at excessive speed, and the speed appeared to be reduced correctly for curves and temporary speed restrictions. The only error, albeit a minor one, was that the speed of the train while travelling in Claverley loop was too fast - a maximum of 37km/hr compared with the authorised 25 km/hr. It is of note that LE (No 1) had to stop his train prior to entering the loop at Claverley, set the route, and then enter, i.e. a very deliberate action.

### **Ergonomics: Train Control Office, Christchurch**

- 1.39 Normally, the TCO would have controlled both the Main North Line (MNL) and the Main South Line (MSL) traffic from the "South Office" during the day. At night, when there is increased traffic on the MNL, the "North Desk" position, some 12 m distant in an adjacent office, is opened and manned by an additional TCO. However, on Monday, 31 October, communications staff were changing over the microphones and associated wiring on the South console during the TCO's shift. This meant that he could not make radio transmissions from that position. The TCO felt that the work would have been better carried out in the weekend when the disruption would have been less.
- 1.40 The TCO controlled trains on the MSL by use of the central control panel and illuminated track diagram in the South Office, but to make a radio transmission, he had to walk through to the North desk and use the radio there. To save time, the TCO activated the Track Warrant Control computer at the North desk, so that he could essentially work the whole MNL from there. It was a very inconvenient period of work, and it went on for about two hours immediately prior to the arrival of 776 at Claverley, and continued for a period after this.



- 1.41 The TCO felt that the technical work should have been discussed with him earlier, and plans made to enable him to do his job closer to the normal way. He said he had no doubt that the way in which he had to move between desks caused him a lot of extra work and stress.
- 1.42 The Communications Supervisor had tried to contact the Train Control Officers in Christchurch to discuss the work that was to be carried out. The TCOs in Christchurch work as individuals; there is no appointed leader or manager, and no one had the responsibility for ensuring that all TCOs knew of the proposed telecommunications work. The TCOs spoken to by the Communications Supervisor felt that Monday afternoon would be a suitable time, but did not pass the information to their colleague who was rostered for duty at that time.
- 1.43 When the TCO arrived for work, the Communications staff had already started their work, and he felt that he had no realistic choice but to accommodate them. It was inconvenient and time-consuming.
- 1.44 The noise level in the Train Control Office suite appeared to the IIC to be high, but no actual measurements of noise were taken. Since this incident NZRL has taken steps to improve the situation by moving an uninterruptible power supply which was the source of a background hum.

### **Track Warrant Control**

- 1.45 Track Warrant Control (TWC) was introduced into New Zealand Railways in 1988 as an alternative signalling system for lower density lines. Amongst other signalling systems it was to replace the Tablet working. TWC is a method for ensuring that only one train has a Track Warrant authorising occupation of a section of track at any time. Track Warrants are issued by TCOs, who dictate the necessary details over radio or telephone to LEs, who write the details on to a prepared form, and read them back to the TCO as a check. When a train reaches the limits of the Track Warrant, the LE must advise the TCO and authorise the cancellation of the warrant.
- 1.46 On NZRL, the management of TWC is enhanced by the use of a computer in Train Control. The computer programme will not normally or inadvertently allow the issue of a track warrant if another warrant already exists for the same track section. TWACS will allow the issue of more than one warrant for a section when they are “Work between Warrants with Work in Conjunction instructions”. These are mainly used for maintenance type work where more than one warrant is required to be in a section. The TWACS computer programme also monitors the reported positions of trains, and will not allow warrants to be issued unless the information is consistent with the last advice logged in.
- 1.47 TWC was introduced in stages on the Main North Line between 1991 and 1993 as a replacement for the Single Line Automatic (SLA) colour light signalling system which was nearing the end of its economic life.
- 1.48 The SLA system had track circuits to detect the presence of trains, and the automatic functioning of the signals from the track circuits gave an indication of main line track occupancy to Locomotive Engineers. The introduction of TWC has eliminated the use of track circuits between stations and most colour light signals.
- 1.49 The absence of colour light signals and track circuits does not necessarily imply that TWC is unsafe. The old electro-mechanical tablet system also provided safe separation of trains without automatic colour light signals and track circuits, or direct radio contact (except in recent years), with train crews for 93 years in New Zealand. It did, however, have the advantage of fixed signals which were operated in conjunction with the system. TWC is, in effect, analogous to an

updated and electronically managed tablet system.

- 1.50 All railway signalling systems require strict compliance with the rules and procedures that govern them. This in turn requires that the operating staff are:
- properly trained so that they know the rules and procedures; and
  - are alert, compliant and observant.
- 1.51 However, there is another quality of any system which is relevant to consideration of TWC. Whereas reliability may be defined as the probability that a system will work exactly as intended, resilience is a quality that may be viewed as “the ability of a system to recover from an error or deviation without a serious or disastrous consequence”.
- 1.52 Centralised Traffic Control (CTC) is a colour-light signalling system in which the presence of trains is detected by track circuits and displayed on a panel in Train Control (as in the Christchurch South position). If an LE makes an error such as driving past a signal at “stop”, there is an opportunity for the TCO to take preventative action by radio calling the Locomotive Engineer of a possible pending collision. CTC is expensive to install and maintain, but does have considerable resilience. In the incident under investigation, had CTC been in use on the MNL, the presence of a train at Oaro or Claverley, or both, should be displayed on the CTC panel.
- 1.53 Under SLA signalling, the TCO would not have an automatic identification of train location. If a train passes a signal at “stop”, a limited number of other signals will give an indication that a train is on the track circuit, but there will not be a clear indication that an error has occurred and that a collision is a possibility if another opposing train has already entered the block section. It could be argued that SLA has slightly more resilience than TWC, but the advantage is not great. Under SLA as it was previously worked on the Main North Line, train crossings are shown in the WTT schedules and if required are altered by written crossing orders dictated by telephone or radio, in a very similar way to track warrant procedures.
- 1.54 Under the tablet system, overrunning the tablet section had exactly the same effect as overrunning the track warrant under TWC. However, the tablet system was managed by staff at every station, and overruns could be easily detected. Staff could immediately notify the next station by telephone. The system had some resilience simply because the error could be rapidly detected and some opportunity existed to take avoiding action, unless another train was already occupying the section.
- 1.55 In the incident that is the subject of this report, the TWC did show resilience, in that the inexplicable error made by LE (No 1) of 776 was detected, and corrective action was taken.
- 1.56 The IIC was informed that the number of train movements on the Main North Line has increased sharply over the last two years. It may be timely for NZRL to give consideration to the adequacy of the resilience of the TWC system on the Main North Line in the light of the reduced train separation that an increased volume of train traffic implies.
- 1.57 In the course of the investigation, it was noted that the TCO, in issuing Track Warrant 18 to LE (No 2) of 701, added two extra conditions that were not recorded in the TWC computer. The warrant was correctly taken down and read back by LE (No 2).
- 1.58 The additional instruction to contact Control at Waipara did not affect safety at all, but improved the ability of the TCO to manage train movements. The TCO pointed out that if after issuing the

warrant he had then given these instructions separately (as he did for Claverley), he would have been quite within his rights. However, adding material to warrants when it is not recorded in the computer is not permitted.

- 1.59 The additional statement in clause 12 “776 may be in the loop at Claverley” was unnecessarily vague. Normally the statement is generated by the computer in that standard format. The situation was not normal in that the computer understood 776 to be at Oaro with Track Warrant 11 cancelled and therefore would not generate this requirement. This is borne out in the TWACS printout for Track Warrant 18 which had no entry in clause 12. The TCO had the ability to overwrite clause 12 by “typewriter” input but did not do so. Again material was added to the warrant which was not recorded in the computer. Whilst this had no direct effect on the events which followed it illustrates the breakdown in procedures which were starting to occur due to the original incorrect location report.
- 1.60 LEs are not required to retain track warrants after cancellation. The IIC was told during the investigation that if LE (No 2) of 776 had “screwed the warrant up and thrown it out the window”, the ensuing investigation would not have taken place. It was further alleged that some drivers ensure that they destroy warrants immediately upon cancellation to prevent any possibility of retrospective investigation. There is no regulation against this.
- 1.61 This raised the issue of NZRL’s monitoring or auditing of compliance with TWC rules, and of the safety culture of some staff. If warrants are not retained at least until the end of the shift, then a random retrospective auditing procedure covering cancellation cannot be implemented effectively. If cancelled warrants are destroyed to prevent auditing, then the possibility of a faulty safety culture seems strong. Sample auditing carried out by staff travelling on locomotives will not necessarily pick up this aspect of System Quality Control.

## **2. FINDINGS**

- 2.1 Train 776 was being operated normally prior to the incident.
- 2.2 Locomotive Engineer (No 1) of train 776 held a valid Track Warrant as far as Oaro.
- 2.3 Locomotive Engineer (No 1) misreported his position to Train Control when he arrived in the loop at Claverley and cancelled his Track Warrant.
- 2.4 In cancelling his Track Warrant, he failed to endorse his copy to that effect, as required by the current Track Warrant Control Rules.
- 2.5 Once the location of train 776 had been confirmed, it was appropriate for the Train Control Officer to issue Track Warrant 18 to train 701 from Oaro to Belfast.
- 2.6 The discovery of the uncanceled copy of Track Warrant 11 on 776 led to the Train Control Officer’s confusion as to the status of the Warrant and the overall situation.
- 2.7 The Train Control Officer acted correctly in reporting the Rules breach to Network Control.
- 2.8 The disruption to the operating environment by maintenance work in the Train Control Office, probably contributed significantly to the Train Control officer’s confusion. This effect may have been accentuated by the possible side effects of medication.
- 2.9 Factors contributing to LE (No 1) reporting his incorrect location were fatigue due to sleep disruption, external stress, and the distracting thought that he may have a fire on his locomotive.

- 2.10 LE (No 1)'s concern about fire was intensified by his stated recent experience with smoke and toxic fumes.
- 2.11 Both the Train Control Officer and LE (No 2) were immediately relieved of duty, in accordance with normal NZRL practice, once the Rules breach was reported to Network Control. LE (No 1) was not immediately relieved of duty in accordance with normal NZRL practice. Normal NZRL practice is to relieve staff of duty who may be involved in a serious Rules breach until such time as the facts can be established.
- 2.12 On the information that was known and should have been available at the time of notification to the Network Controller in Wellington train 701 should have been stopped at the first available location south of Claverley until a relief could be arranged.
- 2.13 Despite the potential for a collision created by the Rules breach it is considered the possibility of a collision between 776 and 701 was highly unlikely although conceivable.

### **3. OBSERVATION**

- 3.1 The effect of medical condition of Operating staff, and associated medication on fitness for duty has been receiving worldwide attention and most authorities now believe that these factors have a greater relevance to operating irregularities than was thought earlier. Whilst in the incident under review the effect of such conditions are not considered a primary factor, their relevance cannot be ignored.

### **4. SAFETY ACTIONS**

- 4.1 NZRL are currently co-operating with LTSA in a study of the Track Warrant Control System on the Main North Line.
- 4.2 During the course of the investigation NZRL advised that the appropriateness of the relief arrangements following the incident had been reviewed and Operating staff had been made aware of the need to critically assess all immediately available sources of information and to immediately relieve all staff in cases where their possible involvement in serious operating irregularities was indicated.

### **5. SAFETY RECOMMENDATIONS**

- 5.1 As a result of the investigation into this incident, it was recommended to NZRL that they:

Review the adequacy of existing procedures for assessing fitness for duty for Locomotive Engineers and Train Control Officers; (005/95)

Review the adequacy of existing audit procedures to assess compliance with Track Warrant Control Rules; (006/95)

Continue to take steps to assess the safety culture among operating staff involved with Track Warrant Control and introduce programmes and procedures to improve it if deficiencies are noted; (008/95)

Establish procedures, with safeguards, for maintenance work in Train Control offices to ensure that Train Control Officers are not unreasonably hampered in the execution of their duties. (010/95)

NZRL responded as follows -

“This response to your letter is provided on the clear understanding it is given “without prejudice” to my previous correspondence pertaining to the definition of “incident”. It is NZ Rail’s view that no “incident” as such occurred.

NZ Rail comments on the safety recommendations are as follows:

**005/95**

The focus of the recommendation does not reflect the findings established during the investigation.

Responsibility for fitness for duty rests with both the employee and the employer.

The recommendation should be reworded as follows:

*“NZ Rail to reinforce to all its employees the need to communicate with supervisors or managers when the individual considers that they are unfit to either commence duty or complete their current shift”.*

As an additional comment NZ Rail is currently in consultation and working through with our employee representatives a new Drug and Alcohol policy which is planned to be implemented in the next three months.

Even in this form, the recommendation is somewhat superfluous. It merely presents NZ Rail’s current practises.

**006/95**

The focus of this recommendation should be widened to include all operating methods rather than identifying just Track Warrant Control rules.

Reword as follows:

*“Review the adequacy of existing procedures to assess compliance with operating rules and practises”.*

Again, procedures are continually reviewed and updated and so the recommendation really may not be necessary.

**008/95**

The focus of the recommendation to be amended to include all operating methods.

Reword as follows:

*“Continue to take steps to assess the safety culture among operating staff and introduce programmes and procedures to improve it if deficiencies are noted”.*

This recommendation could be written following every occurrence and is really fundamental to safety management. It is similar even in its original form to 005/95 and as such could probably be dispensed with.

**010/95**

Minor reword suggested by deleting “with safe guards”.

*“Establish procedures for maintenance work in Train Control offices to ensure that Train Control Officers are not unreasonably hampered in the executing of their duties”.*

This is accepted as a good idea but any “procedures” as such simply represent common sense and would not be complicated in their implementation.

I would be pleased to discuss these changes before the final report is published.”

16 August 1995

M F Dunphy  
Chief Commissioner

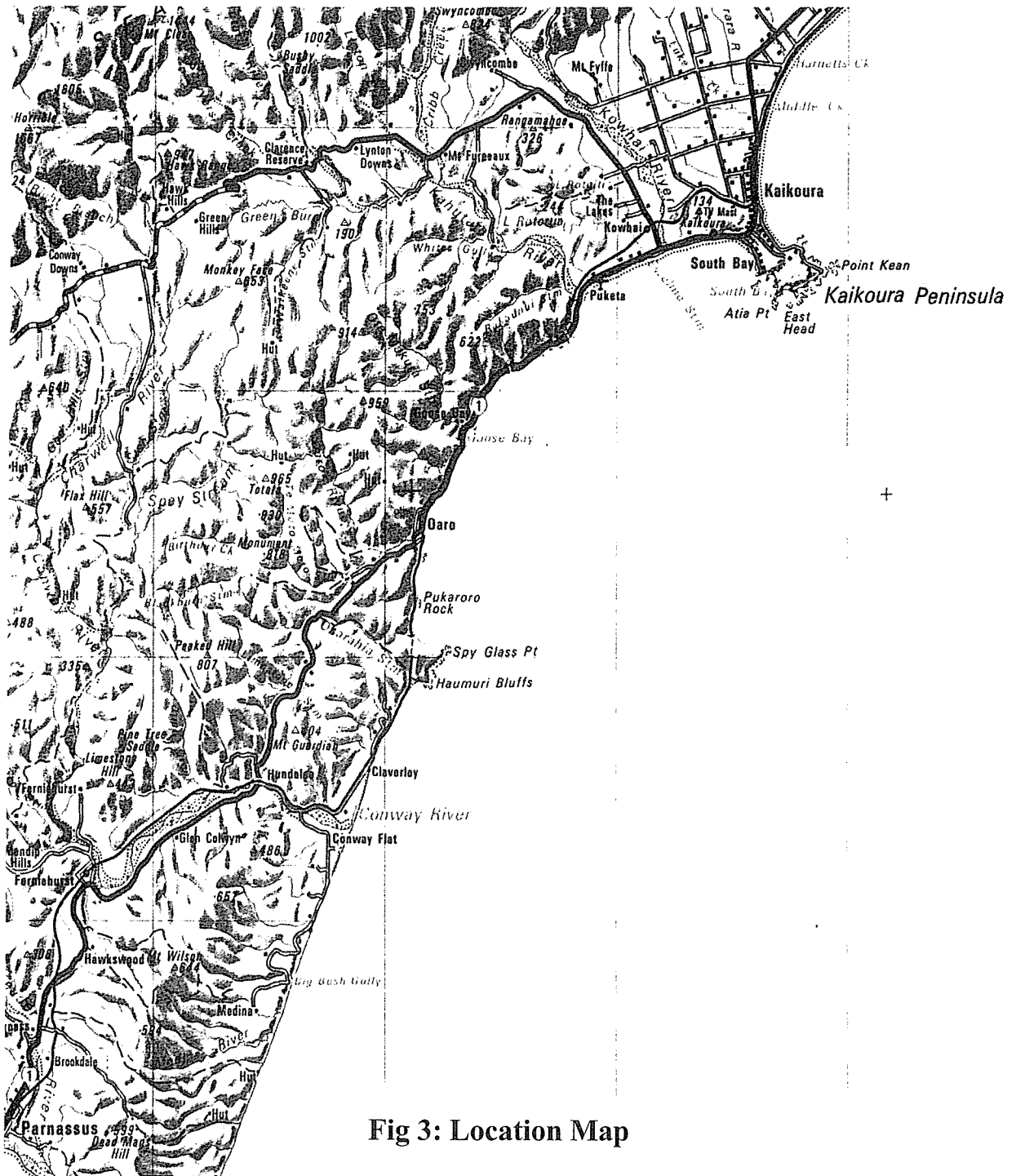


Fig 3: Location Map

## Appendix A

### Train Control Tape Transcript

Time	Speaker	Transcript	Remarks
15:26:00	TCO	Receiving, 776	
15:26:08	776	Yeah, I tried to get you before, I couldn't raise you, um, we're in the loop at Oaro.	
15:26:17	TCO	Roger, you would like to cancel your warrant, would you?	
15:26:24	776	Yeah, 1526, number eleven	
16:09:45	TCO	Receiving 701, over	
16:09:47	701	Clear of Kaikoura	
16:09:51	TCO	Roger, you were there for a few minutes extra, is there any reason, over?	
16:09:56	701	Some of the race crowd were a bit late	
16:10:03	TCO	Roger, thanks, Christchurch Control out.	
16:33:20	TCO	Receiving 701, over	
16:33:23	701	I'm at Oaro, where is this 776?	
16:33:30	TCO	He should be in the loop, over	
16:33:33	701	[clipped transmission] if I see him.	
16:33:50	TCO:	Control to 776. Over.	
16:34:27	776	766[sic]	
16:34:32	TCO:	Roger, Are you in the loop at Oaro? Over.	
16:34:35	776	No, I'm at Claverley at the moment.	
16:34:42	TCO:	Roger. I thought you were in the loop at Oaro. Over.	
16:34:46	776	No, I was trying to get hold of you before. I couldn't get through to you, to tell you about Ferniehurst. But I'm still at Claverley.	
16:34:48	TCO:	Are you in the loop at Claverley ? Over.	
16:34:58	776	Yep, I'm in the loop at Claverley.	
16:35:03	TCO:	Roger. Thanks. Christchurch Control out.	
16:37:48	TCO:	Control to 701. Here is your warrant. It's your warrant No.18, Monday 31 October, Loco Engineer 701 at Oaro.	
16:37:58	701	Hold on, (TCO), not so quick.	
16:38:30	TCO:	Are you ready 701 ? Over.	
16:38:35	701	Go ahead.	
16:38:40	TCO:	Roger. Track Warrant No.18. Monday, 31 October to Loco Engineer 701 at Oaro. Clause 3, proceed from Oaro to Belfast. Clause 6, mainline reported clear 16.26 Delete Except for clause 10, call train Control at Tormore, Waipara and Clause 12, other instructions. 776 may be in the loop at Claverley. Signed, (TCO), Over.	



16:39:20	701	No.18, Loco Engineer 701 at Oaro. No.3 proceed from Oaro to Belfast. No.6, mainline reported clear at 16.26 Delete Except for 10, call at Tormore and Waipara. 12, 776 may be on the loop at Claverley. (TCO).	
16:39:40	TCO:	Roger. That's correct at 16.41. Over.	
16:39:42	701	Correct 16.41. What the hell's going on here, (TCO)?	
16:39:50	TCO:	Oh, we've had communications problems this afternoon. The problems have been working on us out there, so I've been going backwards and forwards and it's caused big problems. Over.	
16:40:00	701	Righto.	
16:43:15	TCO:	Receiving 701. Over.	
16:43:18	701	Yes, 15 clear at 16.44.	
16:43:25	TCO:	16.44. Thanks. Control out.	
16:48:14	TCO:	Control to 701. Can you give me a call clear of Claverley ? Over.	
16:48:19	701	Yeah, will do.	
16:54:45	TCO:	Receiving 776. Over.	
16:54:49	776	Yes, can I get another warrant or reissue ?	Note that the Locomotive Engineers of 701 and 776 have changed over at Claverley. This driver was formerly on 701
16:54:52	TCO:	No, I'm waiting for 701 to clear. Over.	
16:55:00	776	Do you want me to head on through to Oaro, then ?	
16:55:05	TCO:	No way. You're in the loop and you'll stay there until 701 clears Claverley. Over.	
16:55:10	776	Roger. It's just that this warrant hasn't been cancelled yet, and it is to Oaro.	
16:55:20	TCO:	We cancelled it at 15.26. Over.	
16:55:26	776	[expletive, indicating disagreement]	
16:55:42	TCO:	Control receiving 701. Over.	
16:55:48	701	Yeah, away from Claverley now, (TCO).	This Locomotive Engineer was formerly on 776
16:55:54	TCO:	Are you clear of Oaro ? Over.	
16:55:56	701	Yes, clear of Oaro.	
16:56:19	TCO:	Control to driver 701. When you called me cancelling your warrant at 15.26, I thought you cancelled your warrant. Over.	
16:56:30	701	No, I didn't cancel it. What time did you say ?	
16:56:37	TCO:	Would you say again ? Over.	
16:56:40	701	Yeah, I was trying to call you earlier on because the front engine caught fire and I couldn't raise you on the radio.	

16:56:54 TCO: Roger. But you told me that you cancelled your warrant.  
Over.

16:56:59 701 Yeah well, [unintelligible.....] about [unintelligible] going  
to [unintelligible] stay at Claverley because, ummm, the  
engine caught fire, but the track warrant still was for Oaro  
but I stopped at Claverley because I didn't know if we  
were going to get there.

16:57:13 TCO: Roger. But you distinctly gave me the impression that you were  
stopped at Claverley [sic] and you cancelled your warrant.  
Over. No further responses  
from 701

17:10:13 TCO: Receiving 776. Over.

17:10:16 776 Any chance of that warrant yet (TCO)?

17:10:22 TCO: Roger. You're just going to have to stand by until we get this  
mess cleaned up. Over.

17:10:28 776 Yes. OK. I'll sit right here.