Literature Review of Post Traumatic Stress Disorder amongst Rail Workers

HSL/2004/16

Project Leader: Jennifer Lunt
Author(s): Jennifer Lunt and Ruth Hartley
Science Group: Work Psychology
PRIVACY MARKING:

Available to the public

HSL report approval: Phoebe Smith
Date of issue: September, 2004
Job number: JS2003883
Registry file: WP/RE/7S/2004
Electronic filename: Final PTSD amongst rail workers report

© Crown Copyright 2004
CONTENTS

1 INTRODUCTION .................................................................................................................. 1
  1.1 BACKGROUND .................................................................................................................. 1
  1.2 POTENTIAL CAUSES OF RAIL WORKER PTSD: ........................................................... 1
  1.3 UNIQUE CHARACTERISTICS RAIL INDUSTRY TRAUMA ........................................... 2
  1.4 AIMS: .................................................................................................................................. 3

2 METHOD ................................................................................................................................. 5
  2.1 SEARCH STRATEGY: ......................................................................................................... 5
  2.2 SOURCES .......................................................................................................................... 5
  2.3 QUALITY RANKING STRATEGY: .................................................................................... 6

3 RESULTS ................................................................................................................................... 8
  3.1 PREVALENCE, SEVERITY AND CONSEQUENCES OF RAIL WORKER PTSD ............. 8
  3.2 CURRENT RAIL WORKER PTSD MANAGEMENT AND TREATMENT ....................... 14

4 DISCUSSION .......................................................................................................................... 22
  4.1 THE PREVALENCE, SEVERITY AND CONSEQUENCES OF POST-TRAUMATIC STRESS WITHIN THE RAIL INDUSTRY ........................................... 22
  4.2 CURRENT MANAGEMENT PRACTICES FOR PTSD WITHIN THE RAIL INDUSTRY ......................................................................................................................... 24
  4.3 RESEARCH RECOMMENDATIONS ................................................................................. 25

5 APPENDICES .......................................................................................................................... 29

6 REFERENCES .......................................................................................................................... 42
EXECUTIVE SUMMARY

This review was conducted on behalf of HSE’s Railway Inspectorate Sector Strategy Unit. It was conducted to establish the extent to which publicly available research and literature currently informs:

- The prevalence, severity and consequences of post-traumatic stress disorder (PTSD) amongst rail industry personnel.
- Current management practices for PTSD within the Rail Industry.
- Potential improvements in PTSD management and identification of a ‘good’ practice approach.

PTSD can arise following the exposure to a traumatic event. Characteristic symptoms are grouped under persistent mental re-experiencing of the event, reminder avoidance, hyper-arousal and social functioning disruption categories. Evidence quality contributing to this review was ranked according to its applicability to the above objectives. Research parameters excluded PTSD stemming from aggressive or violent encounters, and incident personnel not directly employed by the rail industry. To ensure relevance, the literature reviewed was confined to the rail industry and related areas such as (in order of priority) public transport, road traffic accidents (RTAs), rail crash survivors and small-scale accidents. Emergency services were excluded due to dissimilarities in their training and exposure to traumatic events.

It should be noted that the recommendations produced are based on the findings of the review. They do not, therefore, represent recommendations of the HSE’s Railway Inspectorate

Main findings:

A total of 52 articles concerning PTSD in the rail industry (11 from websites, 25 from academic journals, 12 commissioned reports, 4 newspaper articles) were found, including articles documenting PTSD in rail crash survivors. Eleven of these were formal studies investigating PTSD in rail personnel. This research was mainly conducted in Scandinavia, France, the USA and the London Underground (LUL). The wider UK rail network was underrepresented.

Prevalence, severity and consequences of PTSD: Person under train (PUT) events emerged as the primary cause of PTSD in the rail industry. PTSD generated from Signals Passed at Danger (SPADs) was not identified. Formal research using rail employees exclusively focused on the train driver. There appears international consensus that a train driver can expect to experience at least one PUT event in their career. Prevalence rates for acute PTSD in the month after an incident ranged from 4% to 17%. However, the prevalence of acute psychological distress, including PTSD and other stress reactions such as Acute Stress Disorder (ASD) and phobic avoidance, was found to approximate 40%. Contemporary evidence suggests that the majority of acute PTSD cases do not translate into chronic PTSD. Depending on support availability, natural recovery often occurs without formal intervention. Those risk factors implicated in a more chronic reaction concerned incident severity, non-fatal but severe injury, lone driving in the immediate incident aftermath, inadequate ongoing “natural” support, concurrent life events, “neurotic” personality traits, negative attitudes to emotional expression, and macho-culture. Conflicting evidence was found concerning the effects of previous trauma: Prior exposure to traumatic incidents may generate either an inoculation or accumulation effect. Which dominates may depend on duration between incidents, and personal meaning an employee attaches to an incident. Incidents involving children may undermine previously resilient employees. Sick leave trends suggest that “traumatised” drivers take equivalent sick leave in the short-term as non-traumatised colleagues involved in similar incidents. However, over the course of time,
traumatised drivers may accrue more sick leave than non-traumatised drivers, suggesting effects of unresolved trauma. Negligible rail-specific evidence was found investigating the effects of either primary (intrusion and avoidance) or secondary (sleep-deprivation and agitation) symptoms on work performance. Prevention of “traumatised” rail employees from occupying safety critical roles through occupational screening could provide a possible explanation for this paucity of evidence.

**Management Practices:** Publicly accessible evidence was weaker for management practices. Consequently, interpretations are skewed to Rail Safety and Standards Board (RSSB) research and LUL practices. It was anticipated that Train Operating Companies’ (TOC) respective policies for PTSD management would represent derivatives of British Rail’s (1996) Chain of Care and Support (COCAS) directive. However, no examples of TOC policies were obtained from the publicly available sources investigated. A line manager’s approach in the immediate aftermath of an incident was identified as pivotal in influencing recovery, and it currently appears to be left largely to their discretion. There is only weak evidence to describe their potential dilemma in adopting either a “business as usual” or an empathic approach. Anecdotal evidence implies contextual factors such as passenger complaints, pressure to limit delays and staff shortages potentially thwart their preferred choice. Development of a “buddy” support system within the LUL, comprising “trauma” experienced rail personnel offering immediate “psychological first aid” to colleagues having undergone similar incidents, represents an extension of “natural” support systems. Although no formal evaluation of their efficacy is apparent from the evidence, their instigation by rail employees, and long-standing availability within LUL, underscores value in using a buddy support approach. Debriefing literature emphasises immediate and involuntary formal psychological intervention as potentially detrimental to natural recovery processes. Formal intervention is implicated for personnel without adequate support networks, whose distress persists at clinically significant levels for approximately one-month post incident. Eye movement desensitisation and revisionalization (EMDR), imagery based techniques and graded behavioural exposure represents more structured treatment techniques that have some track record of use in the rail industry.

**Good practice recommendations:**

This review enables a number of recommendations for good practice to be made. The COCAS directive was considered to remain a viable policy basis for PTSD management. However, a policy reflecting good practice could also (in descending order of resource intensity):

- Apply to all types of trauma induced psychological distress besides PTSD, and encompass rail employees, their family and other bystander witnesses.
- Ensure support provision for at least one year post incident, particularly during inquests.
- Make provision for obtaining family forgiveness, wherever appropriate.
- Ensure line managers offer employees the option of being relieved from duty, “time out”, escort arrangements and sanctioning sick leave, and maintaining contact with the employee in the immediate aftermath of an incident.
- Ensure every effort is made to avoid drivers having to continue alone, particularly at night.
- Make provision for a buddy support system. This is contingent on the efficacy of buddy support systems having first been formally evaluated and proven beneficial.
- Offer formal counselling on a voluntary basis, approximately 1-month post incident to allow for natural recovery.

A standardized industry-wide practice for assessing occupation fitness in relation to PTSD could also be adopted. To avoid the risk of a “symptomatic” employees being judged fit for work, sole reliance on clinical judgement ought, in principle, to be prevented. This could be
accomplished by combining clinical judgements of occupational fitness with nationally agreed clinical significance criteria derived from self-report based measures, such as the Impact of Events Scale (IES) (Horowitz, Wilner, Alverez, 1979), General Health Questionnaire (GHQ) 20 (Goldberg & Hiller, 1979) and Trauma Screening Questionnaire (TSQ) (Brewin, Rose, Andrews, Green, Tata, McEvedy, Turner & Foa, 2002). To mitigate any harmful effects an identified “macho-culture” may have on rail employee recovery, trauma support services should preferably be actively promoted at induction and training stages, and on an ongoing basis. Research implies that preventative training can also create an inoculation effect. Corresponding training could be delivered to those personnel more at risk of encountering trauma related events (e.g. train drivers, train managers) on an industry-wide basis, which should emphasise trauma-related stress as a normal response, include ‘experience-based’ contributions from “trauma experienced personnel”, and convey more effective coping strategies. These include professional distancing through focusing on the practical responsibilities of one's role at the scene and perspective taking through recollection of the benefits of the job. Monitoring the incidence of trauma-related stress and contributing factors would also enable the development of more tailored solutions.

Further research investigating prevalence of trauma-related stress reactions, their cause, effective coping strategies and management approach within the British rail network is necessary to shore up substantial gaps in current knowledge.
1 INTRODUCTION

1.1 BACKGROUND

Post traumatic stress disorder (PTSD) refers to the disruptive impact that exposure to an extreme, threatening stressor(s) can have on psychological and physiological functioning (Flannery, 1999). According to the Diagnostic Statistical Manual of Mental Disorders IV’s (DSM IV) (see page 11) criteria, PTSD diagnosis is contingent on:

- Direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity;
- Or witnessing an event that involves death, injury;
- Or a threat to the physical integrity of another person;
- Or learning about unexpected, violent death or serious harm;
- Or threat of death or injury experienced by a family member or other close associate.

Corresponding PTSD symptoms are described in figure 1. These symptoms are clustered under intrusive/re-experiencing, avoidance and arousal categories. The DSM IV criteria is the most widely used framework for diagnosing PTSD (Lally and Sims, 1999). Accordingly, a full formal diagnosis requires the presence of at least one re-experiencing symptom, three avoidance symptoms and two arousal symptoms. Their experience in the immediate aftermath of a trauma is widely regarded as a normal reaction (Rick and Young, 1998; Williams, Miller, Watson and Hunt, 1994). However, if they persist up to 3 months a diagnosis of acute PTSD can be made. Symptoms are considered chronic if they extend beyond 3 months. Emergence of symptoms 3-6 months after the trauma necessitates a delayed onset diagnosis. PTSD is distinguished from Acute Stress Disorder (ASD). Whilst also occurring in response to a trauma, ASD includes PTSD characteristics and additional numbing, awareness reduction, detachment, and dissociative amnesia symptoms that can emerge within one month of the incident, but persist between 48 hours and four weeks in duration (Flannery, 1999).

1.2 POTENTIAL CAUSES OF RAIL WORKER PTSD:

The most salient sources of PTSD within rail workers arises from trains hitting persons, cars or animals on the track, train collisions, derailment and near misses (Vatshelle and Moen, 1997). “Person under train” (PUT) incidents are mainly due to suicide attempts (e.g. Rail Safety and Standards Board, 2003). However, rail worker PTSD can also arise from staff assaults (e.g. Cook, 2001a; London Underground Limited, 2003; RSSB, 2003), injury to self, and, in principle, Signals Passed at Danger (SPADs). Table 1 demonstrates the incident rates of trauma related events during 2002/2003. Traditionally, suicide rates have remained unvaried over time (HSE – Railway safety statistics bulletin 2001/02).

Of the rail industry professions, the train driver is likely to be the most at risk from developing PTSD by virtue of their being at the front of the train. However, any of the other rail industry occupational groups are vulnerable, including guards, station staff, and rail maintenance staff because all have the potential to witness traumatic incidents as listed in table 1.

<table>
<thead>
<tr>
<th>EVENT</th>
<th>SEVERITY</th>
<th>2002/03 INCIDENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicides and Trespass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movement accidents</td>
<td>Fatal</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>Requiring hospital</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>treatment</td>
<td></td>
</tr>
<tr>
<td>Non movement accidents</td>
<td>Fatal</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Requiring hospital</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>treatment</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>393</td>
</tr>
<tr>
<td>Other fatalities</td>
<td>Fatal</td>
<td>50 (includes 5 members of staff)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPADS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A(^1)</td>
<td></td>
<td>401 (8% reduction from previous year, lowest since 1985)</td>
</tr>
<tr>
<td>Category B(^2)</td>
<td></td>
<td>2069* (for 2001/2002)</td>
</tr>
</tbody>
</table>

* Figure obtained from the RSSB report: Category B SPADs. Special topics report (Sizer, 2002).

1.3 UNIQUE CHARACTERISTICS RAIL INDUSTRY TRAUMA

Compared to other “at risk” occupations such as the emergency services or the military, rail industry traumas are atypical. Neither trauma-resilience nor ability to help people through distressing experiences are prime factors underpinning staff selection decisions (Williams et al, 1994). Traumatic incidents as listed in table 1 are also unpredictable and infrequent against the context of staff’s day-to-day operational duties (Cothereau, Beaurepaire, Payan, Cambou, Rouillon and Conso, 2004). For PUT incidents in particular, the train driver is unwittingly driving the agent of fatal injury (Cothereau et al, 2004; Neary Owens, 2001) and has no control over that eventualty once the victim is on the track (Cothereau et al, 2004); nor does the event bear any relationship to their driving competency (Cothereau et al, 2004, Jansses, 2004). This differentiates it from road traffic accident trauma. Unlike other rescue workers train drivers may also see the victim alive, intact and actually make eye contact immediately prior to the incident (Cothereau et al, 2004, Neary Owens, 2001). Even so, the driver still has responsibility for passenger safety whilst managing the incident aftermath and must potentially complete the rest of the journey or shift alone (RSSB, Theme Strategy 23:Occupational health, 2002). During 2002/03, trains were delayed by 9,097 hours through track fatalities and trespass (Network Rail, 2003). Psychological stress to staff resulting from witnessing a track fatality is rated amongst the leading hazards within the London Underground (LUL railway safety case, 2002). Improved management of PTSD could, therefore, produce substantial financial, and ethical benefits for the rail industry.

---

1 Category A SPADs refers to divers passing a stop aspect without authority creating a significant risk. (RSSB, Theme Strategy 3: SPAD reduction and mitigation, 2002)

2 Category B SPADs refers to when a stop aspect or indication is not displayed in sufficient time for a train to be stopped safely. (RSSB, Theme Strategy 3: SPAD reduction and mitigation, 2002)
1.4 AIMS:
This research was conducted on behalf of the HSE’s Railway Inspectorate Sector Strategy Unit. Its main aim was to conduct a literature review evaluating the extent to which available research and literature is available to inform:

- The prevalence, severity and consequences of post-traumatic stress within the rail industry.
- Current management practices for PTSD within the rail industry.
- Potential improvements in PTSD management and identification of a ‘good’ practice approach.
**Figure 1: DSMIV Diagnostic criteria for PTSD**

**DSM IV Criteria for Posttraumatic Stress Disorder**

A. The person has been exposed to a traumatic event in which both of the following have been present:

1. the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others (2) the person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behavior.

B. The traumatic event is persistently re-experienced in one (or more) of the following ways:

1. recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. **Note:** In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.

2. recurrent distressing dreams of the event. **Note:** In children, there may be frightening dreams without recognizable content.

3. acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated). **Note:** In young children, trauma-specific re-enactment may occur.

4. intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

5. physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

1. efforts to avoid thoughts, feelings, or conversations associated with the trauma

2. efforts to avoid activities, places, or people that arouse recollections of the trauma

3. inability to recall an important aspect of the trauma

4. markedly diminished interest or participation in significant activities

5. feeling of detachment or estrangement from others

6. restricted range of affect (e.g., unable to have loving feelings)

7. sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. difficulty falling or staying asleep

2. irritability or outbursts of anger

3. difficulty concentrating

4. hypervigilance

5. exaggerated startle response

E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than one month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

**Specify if:**

**Acute:** if duration of symptoms is less than 3 months

**Chronic:** if duration of symptoms is 3 months or more

**Specify if:**

**With Delayed Onset:** if onset of symptoms is at least 6 months after the stressor
2 METHOD

2.1 SEARCH STRATEGY:

The literature search endeavoured to:

- Keep the search as specific to rail workers as possible (as opposed to other personnel who have contact with the rail industry such as transport police and emergency services).
- Consider all potential rail workers at risk (e.g. drivers, guards, line managers, station staff and maintenance crew).
- Only broaden the search to other related areas once an exhaustive search had been made of rail industry sources. Related areas were chosen on the basis of their similarity with rail industry trauma and need to avoid duplicating other initiatives currently underway within the rail industry. Details of the actual search sequence are listed in figure 2.
- Only consider emergency services and the military services if earlier stages failed to yield sufficient material. This did not prove necessary since it was decided (in agreement with the client) that sufficient material had be uncovered from the more narrow search parameters (figure 2, steps 1 to 4).
- Rank the quality of the evidence according to its ability to inform the main aims of this study. See section 2.3 for ranking technique, article type (anecdotal, case studies, commissioned report, expert opinion, report, and formal study), relevance to the rail industry.
- Confine the search to material produced since approximately 1980 to ensure relevance to contemporary rail industry operations and current definition of PTSD.

Figure 2: Search Sequence:

1. PTSD and rail workers (including underground) (Great Britain and internationally)
2. PTSD and other public transport services (Great Britain and internationally)
3. PTSD and road traffic accidents (Great Britain and internationally)
4. PTSD in rail crash survivors/witnesses (Great Britain and internationally)
5. PTSD and other accident types (e.g. industrial)
6. PTSD and emergency services (ambulance, police, fire and rescue, and hospital accident and emergency, and coastguard services)
7. PTSD and the military

2.2 SOURCES

The following information sources were used.

1. Academic literature databases. These were accessed directly on the website (Ingenta, Web of Science and Psychinfo) and via HSE Library Information Services (HSELINE, NIOSH, CISDOC, RILOSH, Embase, Medline, NTIS, Healsafe, 1Mobility, ITRD).
2. Article reference lists.
3. Rail industry websites. These include the Rail Safety and Standards Board (RSSB), Office of the Rail Regulator (ORR), Association of Train Operating Companies (ATOC), the Strategic Rail Authority (SRA), Rail Maritime and Transport Worker's...
Union (RMT), Associated Society of Locomotive Engineers and Firemen (ASLEF), network rail, all passenger and freight train operator company websites.
4. Rail industry newspapers and national newspaper websites.
5. General internet searches.
6. Phone discussion with an industry expert in the field.

To ensure the search was as exhaustive as possible, the following search terms were used:

- “Post traumatic stress disorder and rail”
- “Traumatic stress and rail”
- “Post traumatic stress disorder and train”
- “Traumatic stress disorder and train”

The term “rail” was substituted by “accident”, “road traffic accident”, “industrial” and “driving” once the search was extended into related to areas. Where the stressor terms proved unsuccessful (e.g. for the rail industry websites) the search terms were broadened out simple statements including, “trauma”, “suicide”, and “fatality”.

Table 2: Number of items found by source type

<table>
<thead>
<tr>
<th>Website</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail specific</td>
<td>11</td>
</tr>
<tr>
<td>RTA</td>
<td>1</td>
</tr>
<tr>
<td>Industry (various)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Academic Journals</strong></td>
<td></td>
</tr>
<tr>
<td>Rail workers reaction to suicide</td>
<td>11</td>
</tr>
<tr>
<td>Rail specific other (e.g. crash victims)</td>
<td>14</td>
</tr>
<tr>
<td>Public transport</td>
<td>1</td>
</tr>
<tr>
<td>Industry</td>
<td>1</td>
</tr>
<tr>
<td>RTA</td>
<td>19</td>
</tr>
<tr>
<td>Rail Crash / other</td>
<td>9</td>
</tr>
<tr>
<td><strong>Government / Industry / Commissioned Reports</strong></td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td>12</td>
</tr>
<tr>
<td>Industry</td>
<td>3</td>
</tr>
<tr>
<td><strong>News paper articles</strong></td>
<td></td>
</tr>
<tr>
<td>Rail other</td>
<td>4</td>
</tr>
<tr>
<td>Telephone discussion</td>
<td>1</td>
</tr>
</tbody>
</table>

**2.3 QUALITY RANKING STRATEGY:**

Evidence for each the aims were grouped into themes (see appendices 1 and 2). For each theme the quality of the evidence was graded according to:

\[ \begin{align*}
\text{On viewing the majority of RTA articles concerned impact of PTSD on RTA survivors. These added little to understanding rail industry PTSD beyond what was provided in rail industry specific articles.} \\
\text{Four reports detailed recommendations specific to PTSD management. Others either provided statistics concerning PTSD causes or indicated relevant occupational health initiatives.}
\end{align*} \]
1. **Article type:** Articles were weighted according to whether they fell under anecdotal, case study, expert opinion, commissioned report, and formal study evidence. They were weighted by multiplying the number of articles by the allocated weighting for that group. Formal studies received highest weighting since their evidence was considered more reliable due to use of formal measures, basis in samples (n>1), and attempts to control for alternative explanations. It was decided not to differentiate between different study types to avoid making the ranking system overly complex. Expert opinion referred to either reviews or interview transcripts with PTSD professionals. Articles were therefore weighted as follows (weighting in brackets):

   a. Anecdotal (1.2),
   b. Case study (1.4),
   c. Expert opinion (1.6)
   d. Commissioned report (1.8) and
   e. Formal study evidence (2.0).

2. **Number of rail worker specific articles.** This provided an indicator of the extent to which research informing a given theme related to the rail industry.

3. **Number of rail worker articles where sample exceeded 75:** This provided an indicator of the extent to which the evidence can be generalised to all rail industry personnel.

A total quality ranking score was then produced through summing article type weighted scores, and total number of articles falling under each of the other categories. The quality rating attached to each article was agreed between 2 reliability raters.
3 RESULTS

3.1 PREVALENCE, SEVERITY AND CONSEQUENCES OF RAIL WORKER PTSD

The types of rail incidents (3.1.1) associated with PTSD, type of rail worker affected (3.1.2), incident probability (3.1.3) and PTSD prevalence (3.1.4) all concern the prevalence of PTSD in the rail industry. Severity relates to PTSD prognosis, and vulnerability factors. Consequences focus on the impact of traumatic stress on the rail worker’s capacity to work. Each of these different facets of rail worker PTSD are discussed below.

Appendix 1 ranks the quality of evidence for themes identified that inform the impact of PTSD on the rail industry.

3.1.1 Incident types

A retrospective Norwegian survey of 395 train drivers asked drivers to recall distressing on-the-track incidents encountered in their career (Vatshelle and Moen, 1997). In order of frequency, those incidents cited comprised the train hitting either a person, car or animal (47%), near misses (17.7%), train derailment (6%) and train collision (4.5%). This work represents the only study uncovered to have systematically quantified the contribution of different rail-industry related traumatic events to rail worker psychological distress. However, it did not specifically assess PTSD. SPAD related distress is not mentioned in this study, although this may be implicit within the near miss figures. Other articles rank the relative risk of different incident types. For example, Garrison (2000) discovered hitting and killing or nearly killing pedestrians as being the most common cause of rail worker trauma. Rick, Young and Guppy (1998) cite suicides, crashes and terminal incidents amongst the leading causes of PTSD. Psychological stress to staff resulting from witnessing a track fatality is rated amongst the leading hazards within the London Underground Limited (LUL) (LUL railway safety case, 2002). None provide accompanying figures. No articles explicitly linked PTSD with SPADs or isolated the effects of incidents where colleagues are victims of the PUT from overall PUT figures. Most of the evidence referred to in the rest of this review is, therefore, based on PUT generated PTSD.

3.1.2 Type of rail worker

3.1.3 Probability of person under the train incidents

According to Cook (2001a), the average UK London Underground driver will experience one PUT incident in 25 years. International researchers have also found high probabilities of drivers having PUT incidents within their careers. In France this probability is slightly smaller than in the UK. Cothereau et al (2004) indicate that 2 out of 3 drivers will experience at least one PUT in their career. Within the US, Napper (1998) indicates the risk to be slightly higher, with the average train driver in the US potentially killing three people within a 25 year period. Given that these predictions represent probabilities, it is likely that many drivers will experience numerous PUT incidents, and some none at all. During a 3 year longitudinal study monitoring PUT incidents in 395 French train drivers, Cothereau et al (2004) found 26 to have two PUTS, two drivers had three PUTS, and one driver experienced four PUTS. For London Underground drivers, McAuley (1992), associates an increased probability of suicide attempts with certain lines, such as lines in the vicinity of psychiatric units. Consequently, it appears that there is a high probability of most train drivers experiencing a PUT at some point in their career, and as mentioned, a proportion will experience multiple PUT incidents.

3.1.4 Prevalence

3.1.4.1 Prevalence of trauma associated events

From their retrospective sample of 395 drivers, Vatshelle and Moen (1996) found that 48.6% had experienced a potential trauma generating rail event of some form during their driving career. Likewise, in a sample of 69 US drivers, Garrison (2000) revealed that 46% had had a traumatic event. These figures demonstrate the prevalence of rail events that are associated with trauma rather than the prevalence of a traumatic reaction.

3.1.4.2 Prevalence of PTSD

Five studies quantified the proportion of rail personnel developing PTSD subsequent to a traumatic event (Anderson et al, 1991; Cothereau et al, 2000; Farmer et al, 1992; Garrison, 2000; Tranah and Farmer, 1994). In the first month following a PUT incident, Farmer et al (1992) found 7 (16%) of 43 London Underground drivers fulfilled criteria for a DSM IV PTSD diagnosis. This PTSD group was distinguished from two other diagnostic groups. A second group (31%, N=13) displayed psychiatric symptoms, for example, phobic anxiety, without full-blown PTSD. The third group (67%, N=51) did not display clinically significant psychiatric symptoms. Nonetheless, some members of this group still scored highly on the Present State Examination-9 (PSE-9) scale (Farmer et al, 1999). These diagnostic groupings were replicated in a larger follow-up of 71 London Underground train drivers experiencing PUT events (PTSD - 17%, non-PTSD psychiatric symptoms - 31%, no psychiatric symptoms - 67%) (Tranah et al, 1994). A total of 32% of drivers evidenced psychological disturbance (PTSD or other psychiatric symptoms) one month after the incident. These two studies found the highest incidence of PTSD in comparison to all other studies on this issue.

In Cothereau et al’s (2004) French cohort, 4% of drivers having been exposed to PUT (N=220) developed DSM IV diagnosed PTSD in the immediate aftermath of PUT (precise timing not specified) at their first evaluation. Exposed and non-exposed drivers were found to differ

5 For the purpose of this review prevalence refers to the number of rail personnel experiencing PTSD at 1month following a traumatic event or subsequently.

6 The PSE-9 is a generic measure for assessing psychiatric symptomology and potential psychiatric “caseness”.
significantly according to the anxiety sub-scale of GHQ-28 scores. In the exposed group, 32% produced clinically significant anxiety scores, compared to 6% of drivers in the non-exposed control group. Of 69 US drivers, Garrison (2000) found 10% developed PTSD following PUT or near miss incidents. Similar prevalence rates have been found in rail incident rescue workers. At 7 months, Anderson et al (1991) discovered 6% of rail disaster rescue workers had PTSD. Collectively, these studies suggest PTSD to be an uncommon outcome amongst drivers and rescue workers exposed to traumatic events. More generic, but clinically significant psychological distress that falls outside strict PTSD diagnostic criteria appears the more prevalent.

3.1.5 Prognosis

3.1.5.1 Recovery patterns

Contemporary evidence suggests train driver PTSD to be a largely acute reaction to a traumatic event. For example, in their longitudinal monitoring of 71 LUL drivers, Tranah et al (1994) discovered that neither PTSD nor non-PTSD psychiatric cases at 1 month post-incident fulfilled PTSD DSM IV criteria at 6 months. Only 2 persisted as psychiatric cases (non-PTSD). No instance of delayed onset PTSD was found. Even so, a high degree of psychological distress was evident for all original diagnostic groups (PTSD, non-PTSD psychiatric, non-psychiatric) (Tranah et al, 1994). More recently, Cothereau et al (2004) found PTSD differences between “PUT exposed” and non-exposed drivers to have disappeared at 1 year. Neary and Owens (2000) also concluded that PTSD represented a short-term psychological disturbance amongst the majority of drivers exposed to PUT. This limited evidence suggests that traumatised drivers undergo natural recovery over time, without any formal intervention having being implemented.

3.1.5.2 PTSD symptom profile

Intrusion and avoidance scores from Vatshelle et al’s (1996) retrospective Scandinavian survey discovered distressed drivers experienced more intrusion than avoidance symptoms. For example, 16% experienced clinically significant intrusion levels as compared to 4% for avoidance. This perhaps reflects the obvious inability for drivers to avoid the driving task if they are to remain in their role.

3.1.5.3 Comorbidity and other stress reactions

Both Farmer et al’s and (1992) Tranah and Farmer’s (1994) work on the London Underground indicate that drivers experience psychiatric stress reactions in addition to PTSD. In Tranah et al’s (1994) study, drivers diagnosed as non-PTSD psychiatric cases tended to manifest phobic anxiety. This proved a more stable condition than PTSD, and, consequently, potentially imposes greater constraints on work capacity in the long-term. Moreover, Theorell et al (1994) and Tranah et al (1994) uncovered evidence of depression co-morbidity with PTSD. Conversely, Anderson et al (1991) did not find co-morbid depression amongst PTSD rail industry rescue workers.

3.1.5.4 Triggers

Emotive triggers can potentially precipitate an overt stress reaction from drivers. For example, Williams et al (1994) described maintenance staff failing to observe an approaching train as being particularly stressful for the driver. Cook (2001a) cites the case of a driver responding

7 For the purpose of this review, prognosis refers to how PTSD prevalence varies over time beyond the first month.
aggressively to a passenger pretending to throw him or herself off a platform. This occurred two days after returning from six weeks sick leave subsequent to a fatal PUT incident.

3.1.5.5 Physical health risks

Some evidence suggests that PTSD presents a potential physical health risk to drivers. As a biomarker of stress, higher levels of plasma cortisol has been found to predict sick leave between three and 12 months after PUT incidents (Theorell et al, 1994). Relative to non-exposed drivers a greater incidence of musculo-skeletal and gastrointestinal disorders was associated with drivers who had experienced an on-the-track accident (Vatshelle et al, 1997).

3.1.6 Vulnerability factors

Literature has highlighted a range of factors that predispose rail personnel to PTSD and contribute to a poorer prognosis (Burnet et al, 2001; Cothereau et al, 2004; Chung et al, 2003; Davis and Breslau, 1994; Garrison, 2000; Holeva et al, 2001; Janssen, 2004; Karlehaugen et al, 1993; Neary-Owens, 2001; Nightingale and Williams 2000; Shelley, King, Peveler, Osola, and Thompson, 1997; Tranah et al 1994; Wiltshire, 1996):

3.1.6.1 Incident severity and scale

Incident type was found to be a factor, which influences prognosis. Vatshelle and Moen (1997) found higher Impact Event Scale (IES) scores to be associated with different types of incident. PUT incidents were found to lead to the highest IES scores followed by collisions, near misses and derailments. Theorell et al (1994) found that drivers had a worse prognosis, and took more time off sick, where severe injury had occurred rather than death or no injury. Garrison (2000) also found that the severity of the near miss determined the severity of stress reaction. Amongst the survivors of the Clapham rail crash, Shelley et al (1997) observed that the probability of developing PTSD symptoms was mediated by injury severity, and feeling at risk of death from intrusion symptoms. Avoidance symptoms were more strongly associated with feeling trapped, and witnessing death. Likewise, Janssen (2004) found that crash severity determined reaction severity in truck drivers. Davis and Breslau (1994) provides anecdotal evidence that the scale of incident can also affect prognosis. For example, they found that even experienced body handlers became traumatised following the events at Lockerbie.

3.1.6.2 Lone Driving

Driving the train away alone after a PUT incident and encountering on the track incidents in the dark have been identified as exaggerating the likelihood of subsequent PTSD (Cothereau et al, 2004; RSSB, 2003). Available evidence did not document how often this occurs.

3.1.6.3 Gender

Gender has also been identified as a possible vulnerability factor (Neary and Owens, 2001; Garrison 2000). From a sample of 69 US drivers, of which 18 were female, Garrison (2000) indicates that female operators reported significantly higher levels of distress following near misses compared with male operators. No other evidence illustrating such gender variations were found.

3.1.6.4 Social support

See section (3.2.4.2)
3.1.6.5 Inoculation versus accumulation effects

Contemporary research provides conflicting evidence concerning the effects of previous trauma on psychological recovery from rail-related trauma. In their prospective monitoring of French train drivers, Cothereau et al (2004) did find generic ‘prior trauma’ to be a risk factor. However, in a study of 175 Canadian bus drivers, Burnet et al (2001) found that, unless a previous event had caused significant PTSD symptoms prior to trauma, it was not a risk factor. Similarly, for rail crash survivors, Shelley et al (1997) observed that survivors who had received previous psychological treatment would be no more or less likely to develop PTSD than those without a history of psychological intervention.

Research focusing on the effects of previous rail specific trauma lends little clarity. Neither Farmer et al (1992) or Tranah et al (1994) identified an accumulative effect of previous PUT accidents on PTSD prognosis. However, Karlehagen et al (1993) obtained higher intrusion scores (obtained from the Impact of Events Scale, (IES), Horowitz, Wilner, and Alverez, 1979) amongst Scandinavian drivers who had experienced more than one PUT incident. Neary and Owens (2001) also found intensity of a driver’s reaction to be mediated by prior incidents. Cook’s (2001a) account of one driver’s experience implicates a near miss 8 years previously in their development of PTSD subsequent to a successful suicide attempt.

An apparent debate between the accumulation and inoculation effects of prior trauma may partly be resolved if the personal meaning a rail employee or other incident personnel attaches to the event is taken into consideration. Even experienced body handlers become susceptible to PTSD if aspects of the incident remind them of their background (e.g. the victim is a child the same age as their own) (David et al, 1994; RSSB, 2003) or childhood experiences (Dunn, 2004), thereby countering any inoculation effects. Wiltshire (1996), for example, describes a case study in which a female member of the public, who witnessed a train fatality, partly attributes her PTSD to similarities between the victim and her own children.

Excessive workload could also contribute to an accumulation effect. An RMT news article describes excessive workload amongst signallers (rmt.org.uk, 2004). Pre-existing work-related stress could perhaps contribute to any predisposition to become psychologically distressed following a traumatic incident.

3.1.6.6 Life Events

According to Cothereau et al (2004), occurrence of life events (e.g. family conflict, relationship breakdown, and financial difficulties) immediately post incident can increase the severity and duration of a driver’s psychological distress. Karlehagen et al (1993) found similar effects in Scandinavian drivers. Negative life events post accident exacerbated intrusion and avoidance symptoms. However, for the London Underground, Tranah and Farmer (1994) found no evidence of life events impacting PTSD development.

3.1.6.7 Personality

3.1.6.8 Negative attitudes to emotional expression

Nightingale and Williams (2000) found a weak positive association between negative attitudes to emotional expression and PTSD predisposition amongst road traffic accidents survivors (N=45). Presence of a macho culture within the rail industry (also see section 3.2.4.2) may therefore exacerbate PTSD prevalence by reinforcing any reluctance rail personnel may have to disclose their own emotions.

3.1.7 Work-related consequences

3.1.7.1 Sick leave

Sick leave represents the most frequently cited work-related consequence of PUT incidents (Cothereau, et al, 2004; Farmer et al, 1992; Garrison, 2000; Karlehagen et al, 1993; Theorell et al, 1994). For example, Theorell et al (1994) found drivers exposed to PUT incidents to have substantially more sick days than controls in (a) the first three weeks post incident and (b) the following 3-12 months (in total 38% of the exposed group had more than one month off compared to 14% in the non-exposed control group). Moreover, phobia reactions predicted 21% of variance in the 3-12 month absenteeism levels. Likewise, Karlehagen et al (1993) associated avoidance with sick leave. In Cothereau et al’s (2004) study, French drivers took on average 4.4 days off immediately after a track incident. In the 1-3 months period following the PUT incident, 12.4% of drivers took sick leave with an average duration of 15 days. In the 3-12 months post incident, 28% of drivers took sick leave, having an average of 16 days off; between 12-24 months, 35% took sick leave with an average of 13 days off. Finally, between 24-36 months, 26% of drivers took sick leave lasting 17 days on average. An apparent increase in the proportion of drivers taking time off over time highlights a possible long-term effect that unresolved trauma has on performance. However, it cannot be determined whether this absence was exclusively due to the effects of trauma. Of the three diagnostic groups (PTSD, non-PTSD psychiatric, non psychiatric) identified by Farmer et al (1992) the PTSD group had 33.1 days off, the distressed group had 19.2 days off and the non-PTSD group had 11 days off in the one to four months after the PUT incident. Karlehagen et al (1993) describes Scandinavian drivers as taking less sick leave than UK drivers.

3.1.7.2 Job Retention

Karlehagen et al (1993) found that the 4 (n=101) Scandinavian drivers who had considered changing job had higher avoidance scores. Garrison (2000) indicated US drivers meeting PTSD criteria as more likely to consider leaving their job.

3.1.7.3 Driving performance

No formal evidence was found documenting the effects of PTSD on the work performance of train drivers or other rail personnel. However, some descriptive evidence was found in truck drivers (Cramer, 2001). Rather than encounter conditions resembling the original accident truck drivers have been found to demonstrate avoidance behaviours. According to Cramer (2001) increased sleeping difficulties associated with PTSD increases the risk of driving errors and emotional reactivity in truck drivers. For example, in the immediate aftermath of a traumatic incident, train drivers describe their training as triggering automatic compliance with post-incident procedures (Cook, 2001a, RSSB, 2003). However, Cook (2001a) describes train drivers as susceptible to making errors during this stage, such as failing to switch off electricity supply to rails. (see section 3.2.1.3) The train drivers interviewed in RSSB (2003) SOVRN report recounted sleeping difficulties following suicide observation. Additionally, motivation to avoid the original incident scene is not going to be possible where train drivers have resumed their
original work role and have to return to the same piece of track. Potential sleeping difficulties or emotional instability may undermine their concentration capacity. David et al, (1994) also describes the perceptual phenomenon of “revisualization” which may also relate to a train driver’s work capacity. This refers to a tendency to perceive other vehicles as larger than they are, and is associated with road traffic accident (RTA) PTSD (David et al, 1994). Again no formal literature was found in the parameters of this review linking revisualization, sleeping difficulties, or emotional reactivity to PTSD and rail employee work performance.

3.1.7.4 Return to work

Cothereau et al (2004) concluded that PUT incidents and PTSD have no significant long-term impact on the occupational fitness of drivers. Of the six drivers interviewed by the RSSB (2003), all went back to work. Dunn (2004) also stated that London Underground drivers do nearly always return to work, but this represents a “monumental” effort for most. Fears regarding loss of income may compel rail personnel to return despite an understandable inclination not to (RSSB, 2003).

3.2 CURRENT RAIL WORKER PTSD MANAGEMENT AND TREATMENT

Appendix 2 ranks the quality of evidence for identified themes informing current management practices.

3.2.1 Procedure

As an overarching framework for managing trauma-related stress, in 1996, British Rail issued a “duty of care” directive entitled “The Chain of Care and Support (COCAS) policy (see appendix 5) applicable to all rail industry employees (RSSB, 2003). This focused on preventative and care measures. Prevention concerned raising awareness both of potential emotional responses to trauma, and sources of support. Care strategies comprised post incident support, fit for occupational health assessments, debriefing, ongoing support and specialist referrals. Since privatisation, TOC policies for managing trauma should, in principle, continue to apply this model. However, it was not within the remit of this review to access individual TOC policy. The extent to which TOC policies consistently model COCAS cannot, therefore, be discerned. Nonetheless, the RSSB (2003) advocates a standardised, “clear” and “unambiguous” “procedure manual” to resolve uncertainty it identified amongst train drivers relating to what they should do following railway fatalities.

3.2.1.1 Family inclusion

Three articles describe the potential impact rail worker PTSD may have on the family. Possible withdrawal by the rail worker from family interaction following a traumatic incident (Neary and Owens, 2001; Cook, 2001a), or desire to avoid disrupting normal family life, (RSSB, 2003) may affect the quality of support the employee receives outside work. Family support is, however, considered more effective than formal therapeutic support (RSSB, 2003, Ormerod, 2002) in facilitating natural recovery in the initial stages. Consequently, the RSSB’s SOVRN report (2003) recommends that welfare policies extend to include the family as well as peripheral witnesses.

3.2.1.2 Inquest inclusion

Occurring some months after the actual incident the RSSB (2003) report recognised inquests as having the potential to revive a driver’s anxiety, principally by placing them face-to-face with
the victim’s family. It recommends that procedures also encompass preparing and attending the inquest. Given that overt forgiveness by the victim’s family has been found to facilitate a driver’s recovery through relieving any guilt (RSSB 2002, 2003), the possibility of accessing family forgiveness could become standardized within welfare procedures (RSSB, 2003).

### 3.2.1.3 Incident aftermath

According to Spiers (2001, cited in Cook, 2001b), following a PUT incident on the London Underground, drivers must notify the line controller, switch off the power supply, de-train passengers, put circuit breakers on line, and await emergency services to take over. No documents were found from the publicly available sources used by this review describing a current industry-wide procedure for delivering support immediately after the incident. Cook’s article (2001a) demonstrates one LUL driver’s experience. It implies that the support offered is currently dependent on the wishes of the driver and line manager’s judgement of the driver’s coping style. Drivers may, therefore, be allowed “space” to recover, given the option of continuing the journey, and/or offered an informal “chat” before going off-duty. The RSSB (2003) report does offer a protocol formalising this approach for future use. It states that drivers should be given the option of being relieved from duty, be accompanied if having to continue to drive, and that contact should be maintained between themselves and their line manager.

### 3.2.1.4 The Line Manager’s Role

The RSSB (2003) also revealed a dilemma facing managers following a traumatic incident. Either they “normalise” the incident by behaving as if nothing has occurred and risk obstructing a driver’s natural emotional reaction, or they take a more empathic approach where any concerned overtones may not be welcomed by the rail worker in question. Both RSSB (2003) and ASLEF (2004) underscore the line-manager’s role as ensuring escort arrangements, sanctioning sick leave, and acting as a case manager beyond return to work. Within these parameters, the particular approach that the manager adopts appears to rely on their discretion.

### 3.2.1.5 Buddy Support System

A buddy support system has been set up within the London Underground specifically offering practical and emotional support to all London Transport workers who have experienced a traumatic incident (Dunn, 2003, Spiers, 2001, McGauley, 1992). Corresponding employees are contacted “shortly” after the incident, and can opt for the service on a voluntary basis (Dunn, 2004). Buddies represent fellow transport colleagues who have gone through similar incidents themselves, or have an aptitude for delivering the support as determined by a screening process (Spiers, 2001, cited by Cook, 2001). They provide a range of support including, assistance getting home, explanation of subsequent procedure, and “psychological first aid” (Dunn, 2004). This service was set up at the request of rail workers (McAuley, 1992, Cook 2001) based on the premise that workers would tend to relate to and identify with colleagues more easily than mental health professionals in the first instance. Cook (2001a) recounts drivers experiencing relief in talking to the public or colleagues with similar experience. No evidence was found indicating other TOCs offering similar bespoke services. In a discussion article, Marcu (1992) recommends an equivalent service for the construction industry.

### 3.2.2 Screening

Table 3 below demonstrates the assessment tools used within the 5 studies formally diagnosing PTSD prevalence amongst rail workers according to DSM IV criteria. None of the studies relied on a single measure alone but instead used two or more tools to detect the presence of PTSD. Use of a range of tools is clearly resource intensive for screening PTSD on a large scale.
Therefore, tool choice must be influenced by their reliability, validity, practicality and construct validity in relation to the rail industry. Two of the assessment methods (Clinician Administered Interview, Blake et al 1995; MINI-mini international neuropsychiatric interview, Lecrubier, 1997;) represented structured clinician interviews, and cannot therefore be used by unqualified assessors. In a sample of rail disaster observers, Chung et al (2003) found intrusion and avoidance scores assessed by the Impact of Events Scale (IES) (Horowitz, Wilner, Alverez, 1979) to correlate with General Health Questionnaire (GHQ) (Goldber and Hiller, 1979) subscales of somatic problems, anxiety, social dysfunction, and depression. Farmer et al (1992) selected the GHQ on the basis of the ability of the anxiety/insomnia sub-scale to detect PTSD. In an attempt to develop a brief diagnostic PTSD tool that could be administered by non-clinical mental health professionals, Brewin, Rose, Andrews, Green, Tata, McEvedy, Turner and Foa (2002) developed the Trauma Screening Questionnaire (TSQ). Including a sample of 41 rail crash survivors in its standardisation, the TSQ was found to possess equivalent reliability and sensitivity to the clinician administered PTSD scale (Blake et al, 1995). Comprising just 10 re-experiencing or arousal symptoms, Brewin et al (2002) discovered six of these, in any combination, to have 92% efficiency in detecting PTSD cases as diagnosed by the clinical interview (see appendix 3 for TSQ questionnaire content).

Table 3: Summary of PTSD diagnostic tools

<table>
<thead>
<tr>
<th>Tool (Author)</th>
<th>Description</th>
<th>Used by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Impact of Events Scale (IES) (Horowitz, Wilner, Alverez, 1979)</td>
<td>Measures intrusion and avoidance symptomology experienced over previous 10 days, 15 items. Produces totals score (&gt;40 indicate clinical significance), and scores for two subscales: 1. Intrusion (&gt;20 indicates clinical significance for intrusion) and 2. Avoidance (&gt;20 indicates clinical significance for avoidance).</td>
<td>Karlehagen et al (1993), Farmer et al (1992), Tranah and Farmer (1994), Vatshelle and Moen (1996) (used to detect psychological distress)</td>
</tr>
<tr>
<td>MINI-mini international neuropsychiatric interview (Lecrubier, 1997)</td>
<td>15 minute clinician administered diagnostic interview, assesses conditions including major depression, panic disorder, and PTSD</td>
<td>Cothereau et al (2004)</td>
</tr>
<tr>
<td>PTSD interview check list (DSM III, DSM IV criteria)/Clinician Administered Interview (Blake, 1995)</td>
<td>Standardised and supplemental questions used to assess presence of 17 PTSD symptoms, categorised under sections B, C and D of DSM III/IV.</td>
<td>Farmer et al (1992), Tranah and Farmer (1994)</td>
</tr>
</tbody>
</table>
3.2.3 Treatment

3.2.3.1 Treatment process

Allowing for a few days natural recovery, London Underground Occupational Health Services endeavour to approach rail worker employees within one week post-incident to make them aware of the trauma counselling provision (Spiers, 2001; cited in Cook 2001b; Dunn, 2001, 2004; McCauley, 1992). As with the buddy support systems, all rail workers involved in a traumatic incident are approached and offered psychological assessment on a voluntary basis. Rail workers can self-refer or be referred by their GP or manager, provided it is with their consent. Trained counsellors deliver assessment and subsequent intervention. Hard to resolve cases are referred on to a clinical psychologist. The treatment process itself is based on a debriefing framework, with specific psychological techniques offered at later stages (Dunn, 2001). These techniques are described in section 3.2.3.2.

Out sourcing: The bespoke trauma counselling service delivered by London Underground appears atypical within the rail industry. Anecdotal evidence suggests that other TOCs outsource psychological trauma interventions to external occupational health services, clinical psychologists or employee assistance programmes (EAP) (Dunn, 2004).

Union recommendations: Rather than using TOC provision, ASLEF recommends in a PTSD profile leaflet (see appendix 4) that rail workers access help via their G.P. No indication was given about why this recommendation was made.

3.2.3.2 Treatment Techniques

Evidence was found demonstrating the application of six treatment techniques to either rail industry or RTA trauma cases. These consisted of:

Debriefing: Debriefing refers to “interventions conducted by trained professionals shortly after a catastrophe, allowing victims to talk about their experience and receive information on ‘normal’ types of reactions to an event” (Friedman, 2000). Universally applied debriefing in the immediate aftermath of an incident is now considered potentially detrimental (Ricks, 2000, cited in Hall, 2000; Rose & Tehrani, 2002; Highfield, 2002). This is due to possible interference which natural recovery, re-traumatising through re-exposure, or raising expectancy that psychological difficulties will inevitably occur (Ormerod, 2000). However, where offered on a voluntary basis by trained professionals 2 to 3 weeks post incident, debriefing that normalises the stress reaction, provides support, practical assistance and access to other psychological interventions, is more likely to facilitate recovery and return to work (Rose et al, 2002, Dunn, 2004). However, in an earlier paper advocating debriefing in the rail industry, Williams, Miller, Watson and Hunt (1994) emphasise that debriefing should not be optional, otherwise susceptible rail workers may not attend due to pressure from the “macho” culture prevailing in the industry (Williams et al, 1994).

London Underground’s trauma and counselling service represents the only source of evidence describing in any depth application of debriefing to the rail industry. Their approach is based on just over 10 years’ experience of working with traumatised London Transport employees (Dunn, 2004). A four-stage trauma-after care model is used, which is underpinned by debriefing principles. This consists of:

1. Making contact, establishing a working alliance and creating a safe environment.
2. Assessment.
3. Resourcing.
4. Ending or preparation for other treatment techniques.

Intervention proceeds on the premise that initial discussion of the event itself can cause undue distress. Therefore, initial counselling sessions focus on the rail workers response and only moves on to the incident itself where avoidance symptoms are no longer indicated (Dunn, 2001; 2004). Actual technique choice in the last stage of the model is contingent on an employee’s ability to mentally “revisit” the incident. No evidence was found formally evaluating the efficacy of a debriefing approach within the rail industry, although Dunn (2001) cites case examples of successful trauma resolution.

Eye movement desensitisation and revitalization (EMDR): EMDR entails a trained therapist eliciting bilateral eye movements from the client, usually by the client tracking their finger from side-to-side. During the movement the client is asked to visualise an aspect of the traumatic incident while repeating a negative self-statement that this image evokes in order to desensitise themselves to the incident. The negative self-statement is then substituted with a positive statement, allowing the client to reframe their interpretation of events in a more positive light (Wo, 1992, Shepherd, Stein and Milne, 2000). Ongoing debate surrounds the efficacy of EMDR (Lally and Sims, 1999). This stems from difficulties in isolating the relative benefits of the bilateral movement from cognitive behavioural components of the approach (Smith and Yule, 1999). A review by Shepherd et al (2000) finds it as effective at 3 months as exposure therapy (imaginal or behavioural), and more effective than relaxation training. Its main benefits are that it is relatively brief, and inexpensive. Using “Positron Emission Tomography” (PET), Huber, Siol, Herholz, Lenz, Köhle and Heiss (2001) identified a neuroanatomical correlate of PTSD flashback amongst 5 German train drivers who had experienced PUT incidents when pulling into station. Controlling for neuroanatomical confounders (each driver was right handed and without previous psychiatric history), activation of areas of the brain associated with visual and episodic memory was produced in response to trauma reminders, but not in response to other emotional cue types. Huber et al (2001) inferred this to demonstrate a neuroanatomical “closed loop” which directs “attention to internal imagination and temporary functional withdrawal from the external world”. EMDR was hypothesised to work by providing an external trigger for breaking the loop. Together with its inclusion in the treatment protocol of LUL’s trauma service, this study’s basis in a rail worker sample indicates some merit in applying EMDR to rail workers, providing they can contend with its imaginal component (Dunn, 2001).

Imagery based techniques: Guided imagery techniques tend to be the most widely used approach for treating PTSD (Lally and Sims, 1999), because they enable the individual to gradually reencounter the experience in a controlled setting. Of 12 car drivers experiencing driving phobia subsequent to RTAs, 6 resumed driving after receiving imaginal desensitisation (Kuch et al 1984). Grunert, Smucker, Weis, Rusch (2003) presents two case studies of having successfully applied the approach to industrial accident victims. Trauma incident reduction (TIR) is amongst the techniques used within LUL (Dunn, 2004). Similar to imaginal flooding, the client repeatedly remembers the incident using a highly structured and repetitive treatment protocol, until symptoms diminish (Valentine, 1999). Although not formally evaluated on a rail worker population, TIR’s brief duration, and straightforward approach lends itself to use by “non-degree” therapists (Valentine, 1999).

“Bodywork” techniques: Bodywork techniques are used within LUL’s trauma counselling services when imagery techniques are indicated to provoke excessive distress (Dunn, 2004). Based on a premise that the PTSD response is retained within the body’s self-regulating processes, techniques, include body-centred exercises and peristaltic massage and are intended to restore the body’s balance (Jess, 2001). No formal evidence was found evaluating its application to rail workers.
**In vivo exposure:** Referring to “real life” exposure to the trauma setting, graded in vivo exposure typically forms the latter stages of treatment for rail workers (Cook, 2001a, 2001b, Dunn, 2001, 2004; McAuley, 2003; RSSB, 2003). For example, train drivers may gradually be reintroduced to their original role in the following sequence:

- Platform duties
- Travel on train as passenger
- Travel in cab
- Drive with train manager (for a period of a few weeks)
- Driver drives over trauma incident route with manager.
- Driver drives alone.
- Driver drives alone over trauma incident route.

Although a standard approach to PTSD following imaginal exposure (Lally and Sims, 1994), the RSSB (2003) SOVRN report recommends that in vivo techniques undergo further investigation, particularly in relation to simulation methods.

**Drug Therapy:** In non-safety critical populations, psychotropic drugs are often prescribed as part of the treatment of PTSD (Lally and Sims, 1994). The Railways (Safety Critical Work) Regulations 1994 (RSCWR) requires that rail employees are competent and fit wherever they undertake safety critical work (HSC (2004) Consultation Document - Proposals for new safety regulations for railways and other guided transport systems). Since drowsiness can be produced as a side effect of psychotropic medication (Lally and Sims, 1994), use of drug therapy as a treatment for PTSD could potentially preclude staff from undertaking safety critical roles. Any occurrence of train operators actually driving whilst under the influence of psychotropic medication was not apparent within this review.

### 3.2.4 Strategic and organisational factors

#### 3.2.4.1 Occupational health strategy

In Cothereau et al’s (2004) study, PTSD was diagnosed by an occupational health physician rather than a psychiatrist. As a result, they reason that their PTSD rate is a more accurate reflection of PTSD morbidity amongst rail employees, because perceived “stigma” surrounding psychiatric assessment may deter rail workers from using occupational health services. The RSSB strategy 23: occupational health (2002) document profiles the type of services that should be offered within the rail industry:

- Pre employment screening
- Health surveillance,
- Sickness absence management,
- Return to work health assessments,
- Fitness for work assessments,
- Counselling services,
- Health education,
- Workplace risk assessment,
- Debriefing services.

The extent to which rail employees have universal access to such services could not be discerned from this review. Workplace risk assessment will have a key role in determining whether a PTSD sufferer is fit to return to work, resume driving, and indeed resume driving.
alone. Limited evidence would suggest that this decision is largely made based on clinical judgement rather than formal psychometric testing (Dunn, 2004; RSSB 2002).

3.2.4.2 Organisational culture and support

Some evidence implicates a macho culture operating within the rail industry as deterring employees from using PTSD occupational health services (RSSB, 2003; Williams et al, 1994), and motivating staff to return to work prematurely (McAuley, 1992). Relative to non-PTSD drivers, PTSD diagnosed drivers considered the support they received to progressively deteriorate in the 12 months post incident (Theorell et al, 1994). However, as this is based on a Scandinavian sample this limits generalisation of this observation to British drivers. Evidence from RTA generated PTSD also underscores the importance of social support. A perceived reduction in social support was found to increase PTSD likelihood in RTA survivors (Holeva, Tarrier and Wells, 2001). PTSD susceptibility was magnified further by an interaction between perceived social support and reliance on social control as a coping strategy.

3.2.4.3 Monitoring

Occupational health monitoring: Network Rail’s “Rail Safety and Environment Plan” for 2003 proposes a “managing for health programme” to monitor rail industry employees’ health and tailor improvements accordingly. This may include PTSD monitoring. However, ASLEF’s “managing attendance for best practice” guidance recommends that trauma-related absence be excluded from absence monitoring policies (aslef.org.uka, 2004).

3.2.4.4 Legal services

According to ASLEF, rail workers suffering PTSD as a result of rail industry-related traumas are entitled to criminal injuries compensation claims, (Aslef.org.uk/publications/managing_for_attendance/page15).

3.2.4.5 Promotion of trauma services

The RSSB (2003) SOVRN report describes limited awareness in the rail industry of counselling service provision. This underscores need for increased promotion of trauma intervention availability within the rail industry.

3.2.4.6 Preventative education and training (Coping strategies)

By raising awareness of what to expect following a traumatic incident, training in trauma effects and appropriate coping techniques has been found to increase resilience and reduce consequent susceptibility to PTSD in rail incident personnel (Anderson, Christensen and Petersen 1991; RSSB, 2003). Trained rail disaster rescue workers have been found to have less severe stress reactions than public witnesses and untrained volunteers (Bryant 1996; Chung et al, 2003;). Likewise Braddon et al, (1993) found trauma trained police officers involved in body handling duties following a rail disaster experienced less distress than untrained colleagues (cited in Ricks et al 1998). The RSSB (2003), and ASLEF (aslef.org.uk) recommend training rail personnel, including line managers, in trauma effects and management. Marc's (1999) also recommends such training for construction industry advisors. The development of buddy support systems (see section 2.2.1.5) highlights the potential value of including rail personnel having experienced traumatic incidents in a preventative training.
When reviewing application of Occupational Health Psychology to the rail industry, Cox et al (2003) identifies a training need for raising the general public’s awareness of the impact their behaviour can have on rail industry health and safety. By default, this should extend to welfare risks presented by selecting the railway as a suicide method.

Recognising a need to raise awareness of trauma effects within the rail industry, ASLEF (see appendix 4) have produced a leaflet describing the effects of PTSD. Similarly, LUL have disseminated information leaflets amongst their rail personnel (Dunn, 2004). The extent to which such strategies for raising awareness of trauma effects are common practice cannot be judged from this review. However, these few examples would suggest that there are relatively few systematic efforts to promote awareness on an industry-wide scale; nor was any evidence found that these strategies have, as yet, been formally evaluated.

Coping Strategies: Research concerning the more effective coping strategies can be used to inform the advice that any awareness promotion or training material should contain. The “black humour” typically used amongst emergency service personnel as a way of cognitively reframing a traumatic event has also been found amongst train drivers and British Transport Police (RSSB, 2003). Drivers and police described it as enabling them to “dehumanise the incident” and enable “emotional detachment”. Other “depersonalising” cognitions, such as viewing a body as an object rather than a person was reported helpful, as was taking a pragmatic attitude and viewing such events as a downside to an otherwise satisfactory job (RSSB, 2003). The RSSB (2003) recognises avoidance and emotional suppression as being unhelpful (RSSB, 2003). Although, Anderson et al’s (1997) discovery of increased tobacco, alcohol consumption and tranquilliser dependency in just 2 of 83 rescue workers, 7 months after their involvement in a rail disaster, suggests a low prevalence of avoidance strategies that would affect concentration. However, this does not reflect the extent to which rail personnel themselves currently avoid PTSD anxiety through alcohol or medication.

Other evidence implies that habitual coping strategies may not lend themselves to dealing with unexpected or uncontrollable events. For example, Chung et al (2001) found that local residents witnessing a rail disaster who were used to relying on problem-focused techniques had poor PTSD outcomes. Trying to contend with stress by controlling the cause is clearly ineffectual when applied to catastrophes.
4 DISCUSSION

This literature search endeavoured to systematically investigate current knowledge regarding:

1. The impact PTSD has on rail workers (prevalence, severity and consequences), and
2. Current rail industry PTSD management practices with a view to informing best practice.

Resultant evidence was ranked according to its ability to inform the study’s overall aims.\(^8\) Ranking was a reflection of the volume of rail relevant research undertaken in this area as well as scientific rigour. It also represented a relative indicator of evidence quality. Evidence was separately considered according to PTSD impact on the rail workers and management of good practices. Study parameters excluded PTSD arising from aggression, and PTSD arising in emergency personnel attending a rail incident who are not directly employed by the rail industry.

4.1 THE PREVALENCE, SEVERITY AND CONSEQUENCES OF POST-TRAUMATIC STRESS WITHIN THE RAIL INDUSTRY.

Corresponding literature relating to this area was heavily biased to rail worker PTSD in other countries, namely Scandinavian countries, North America and France. Evidence concerning the British rail industry focused on the London Underground Limited’s experiences. Whilst RSSB’s (2003) SOVRN report interviewed train drivers from other UK TOCs, this addressed only 5 drivers. The wider UK rail network is consequently underrepresented within the literature. In addition, studies that have been included may also fail properly to represent rail employees forced to leave the industry as a result of trauma. With the exception of Cothereau et al’s (2004) recent findings, the majority of formal studies uncovered were conducted in the early to mid 1990s.

4.1.1 Prevalence

Of the potential causes of rail related trauma investigated amongst rail workers, person-under-train incidents were most strongly associated with PTSD. Most of these concerned suicides. This perhaps reflects a dominant focus of rail worker research on the driver. Rail collisions may, therefore, not have figured as high, because the driver is less likely to have survived such incidents. None of the research identified assessed any influence SPADs may have on PTSD development. Possible trauma effects generated by SPAD occurrences may, however, be subsumed by near misses. Nonetheless, only one study (Vatshelle et al, 1997) actually quantified the extent to which various incident types contributed to driver distress. Consequently, more research specific to the British rail network is needed to clarify the various causes of rail worker PTSD and quantify the risk each presents. Scant evidence was found documenting PTSD in rail personnel other than the driver, such as guards, line managers, station staff, and rail maintenance crew. Intuitively, given that PUT incidents can potentially occur anywhere on the network, it is difficult to imagine these staff not also being affected. PTSD research in the rail industry, therefore, needs to be extended to include a much broader range of rail professionals. As a result, subsequent discussion focuses on train driver PTSD.

Stronger evidence (see footnote for definition of “strong”) was found concerning the probability and prevalence of traumatic events in train drivers, as well as the possible extent of resultant

\(^8\) For the purposes of the discussion, quality of evidence ranking for each theme can be broken down into strong (ranking scores >16), moderate (ranking 6-15) or weak (ranking <5).
PTSD. As a rule of thumb, it appears that, an average driver can expect to encounter at least one PUT in a career spanning 25 years. Current initiatives to prevent railway suicide (Dunn, 2004; RSSB, 2002, Theme strategy 15: Suicide) may ultimately lengthen these odds. Scandinavian retrospective investigations found that of the order of 50% of train drivers had experienced psychologically distressing events in their rail career. Despite these figures, only a relatively small proportion develops DSM IV PTSD. Prevalence rates ranged from a recent 4% in France (Cothereau et al, 2004) to 17.1% on the London Underground during the early 1990s (Tranah and Farmer, 1994). No research was found indicating current PTSD prevalence rates within the UK. Whilst full-blown PTSD development may be relatively uncommon, moderate evidence (see footnote on previous page for definition of “moderate”) indicates that a larger proportion of drivers exhibit either PTSD or other signs of distress, such as phobic avoidance that may impact upon their work capacity (Farmer et al, 1992; Karelehagen et al, 1993; Tranah et al, 1994). Any best practice approach should consider all types of psychological distress following traumatic events, particularly if Tranah et al’s (1994) observation that phobic avoidance is more stable than PTSD is to be borne out.

4.1.2 Severity

Where diagnosed, the literature reviewed implied PTSD in drivers could be considered a predominantly acute reaction (see page 3 for definition of acute). It seems that very few affected drivers go on to develop chronic PTSD, at least at one year (e.g. Cothereau et al, 2004; Dunn et al, 2004). Various vulnerability factors can be used to caution against a worse prognosis. Stronger rail specific evidence implicates an accumulative effect of multiple traumas, rail or otherwise. This contradicts evidence mainly obtained outside the rail industry for an inoculation effect, as well as the use of trauma experienced rail personnel by buddy support systems. Duration between events, and their successful management may determine which effect dominates. There is a more definite need for research to clarify the role of previous trauma on rail worker susceptibility to PTSD. Moderate evidence implicated witnessing non-fatal severely-injured PUT survivors, incident scale, concurrent life events, “worry” related personality traits, poor support systems and lone driving immediately following an incident as risk factors for a poorer PTSD prognosis. Little rail-relevant research had been conducted exploring the role of employees’ negative attitudes to emotional expression on PTSD progression, or health risks associated with rail worker PTSD.

4.1.3 Consequences

Most of the evidence addressing work-related consequences examined sick leave. An apparent tendency emerged following PUT incidents for more distressed drivers to initially take the same amount of time off as their less distressed counterparts. In the long run, it seems, however, that more distressed drivers will incur greater sick leave. Unresolved trauma could possibly account for this trend. Understanding of the effects of PTSD on work performance represents a substantial gulf of knowledge. Effects found in RTA related incidents, such as emotional liability, sleep disturbances, possible revisualisation, as well as the distracting effects of intrusive symptoms are likely to have some impact on a rail employee’s work performance. However, exclusion of badly affected drivers through occupational health screening may render research into these areas impractical and risk laden. Despite the obstacles PTSD may present to a driver, the available evidence suggests long-term occupational fitness is largely unaffected. However, corresponding studies (e.g. Cothereau et al, 2004; Theorell et al, 1994; Vatshelle et al, 1997) may omit employees that have left the industry because of PTSD.
4.2 CURRENT MANAGEMENT PRACTICES FOR PTSD WITHIN THE RAIL INDUSTRY.

Comparison of quality ratings relating to current management practices with those informing PTSD impact is telling (see appendices 1 and 2). None of the management practice research ranked as strong evidence (see footnote, p26). This is due to reliance on the RSSB’s (2003) SOVRN report recommendations, rail union information and London Underground Limited’s trauma counselling service as main evidence sources. Negligible evidence was found from publicly available literature documenting sources of PTSD management practices or treatment services in other British TOCs. This could suggest:

- lack of a documented cross industry consensus on PTSD management,
- lack of a documented systematic approach to PTSD management at an individual TOC level, and
- possible widespread outsourcing of treatment to external occupational health or counselling providers (Dunn, 2004).

4.2.1 Procedure

Current industry-wide application with the COCAS duty of care guidelines, or TOCs’ respective versions, could not be established from publicly available literature sources. A small amount of research highlights a line manager’s role in the immediate aftermath of the incident as potentially pivotal in determining train driver recovery. Dependent on the context and urgency to prevent delay, a line manager must find an appropriate balance between an empathic and “business as usual” approach. No formal evidence was found indicating replication of London Underground’s buddy support system elsewhere in the industry, although weak anecdotal evidence suggested its application in the construction industry. Moderate evidence indicated the Impact of Events Scale and General Health Questionnaire as the most widely used self-report tools for evaluating rail worker PTSD, accompanied by clinical interviews structured around DSM IV diagnostic criteria. The Trauma Screening Questionnaire (TSQ) (Brewin et al, 2002) was identified as a potential reliable substitute for more lengthy diagnostic procedures.

4.2.2 Treatment

Natural recovery patterns associated with rail driver acute PTSD suggested a combination of existing support networks, and time off work as sufficient for allowing recovery in the majority of PTSD cases. Indeed, according to DSM IV diagnostic criteria (see page 3) PTSD symptoms diagnosed in the immediate aftermath of incident cannot officially be regarded as PTSD until one month has elapsed. Acute psychological distress in an incident’s wake is regarded as a normal response (Dunn, 2004). Buddy support systems can be considered an extension of existing support system. Outside the rail industry, obligatory and immediate debriefing is now widely acknowledged as being counterproductive. Moderate evidence as applied to the rail industry suggests that debriefing may be appropriate if offered on a voluntary basis 3 to 4 weeks after the incident to individuals for whom natural recovery has not occurred. LUL’s experience emphasises initial focus on the rail workers’ emotional response as opposed to cause as preferable. Moderate evidence supported application of EMDR and TIR in rail worker populations as more pragmatic PTSD treatment techniques. Use of standardised treatment protocols means that these techniques can be administered by “non-degree” trained therapists. Reliant on imagery, neither EMDR nor TIR are considered appropriate for employees unable to “mentally revisit” the incident, in which case LUL’s trauma and counselling services use “body centred” techniques. Moderate evidence indicated graded reintroduction to the original work role as more standard practice, for example being accompanied by a line manager.
4.2.3 Strategy

With the exception of LUL, the TOCs’ actual occupational health and rehabilitation strategies were not accessible from the information sources used in this review. Content and extent of industry-wide occupational health provision for PTSD therefore requires further investigation. Some debate emerged concerning whether psychiatric led, as opposed to the physician-led, PTSD screening would deter rail personnel from using rehabilitation services. The process by which an occupational fitness judgement is made also requires further exploration. Weak evidence would suggest this is overly reliant on clinical judgement rather than industry-standardised objective criteria.

Weak evidence suggests that a “macho-culture” may be constraining traumatised rail employees from coming forward and seeking official help. A perceived macho culture may in turn reinforce negative attitudes rail employees may themselves retain towards appearing “soft”. Efforts to promote psychological distress as a normal response to rail-related trauma within LUL could ultimately undermine any harmful impact this culture may have on PTSD management if conducted across all TOCs.

Moderate consensus largely gained from disaster rescue research, underscored the value of preventative training in mitigating an incident’s traumatic effects. Weaker rail-specific evidence demonstrated pragmatic coping attitudes, perspective taking and “depersonalising” appraisals to better enable rail employees to carry out distressing tasks without subsequently becoming “traumatised”. Such coping strategies could be encompassed in any preventative training.

4.3 RESEARCH RECOMMENDATIONS

This review has revealed a lack of formal research investigating PTSD in the British rail network. Utmost is a need for more formal controlled research to be conducted across TOCs. Specifically future research needs to:

4.3.1 PTSD impact

- Clarify the prevalence of PTSD and other forms of trauma-related distress, such as acute stress disorder and phobic avoidance, in the British rail industry. This should include all forms of rail personnel besides the driver, such as guards, station staff, cleaning personnel, signal staff, and maintenance workers. Any variation by TOC may reflect differences in a management approach.
- Establish the extent to which acute cases of PTSD “naturally” resolve, and circumstances under which progression into a chronic phase occurs.
- Quantify the severity of risks presented by rail-industry related traumas, including any trauma engendering effects of SPADs.
- Clarify the range and influence of identified vulnerability factors. This can be used to inform preventative and care strategies, including recruitment.
- Clarify circumstances under which repeated exposure to traumatic events can create either an accumulation or inoculation effect. This should consider duration between events, support availability, coping strategies and facets of the incident that can undermine any built up resilience.
- Establish the extent to which train operators have to continue driving alone following a distressing track incident.
- Crucially, systematically investigate any harmful effects that specific PTSD symptoms, such as intrusion, or avoidance can have on concentration, and, by implication, work capacity. Secondary symptoms, such as fatigue or agitation could have similar effects. Whilst occupational screening procedures may exclude train operators at risk from
experiencing these symptoms whilst driving, the unpredictable nature of PTSD (Cook, 2001a) can mean symptoms can be triggered unexpectedly. The precise risk this generates needs to be more clearly understood.

4.3.2 Management practices

- Establish the extent to which TOCs operate specific policies informing the management of PTSD, their resemblance to the COCAS directive, and corresponding occupational health provision.
- Evaluate the efficacy of the PTSD treatment approaches, including buddy support systems, EMDR and TIR currently used within the rail industry on a sample of rail personnel.
- Evaluate, in particular, the efficacy and risks presented by in vivo techniques, including simulation methods (RSSB, 2003). For example, how is a decision made to move from accompanied to lone driving? What are the risks associated with this? How can they be mitigated?
- Clarify generic coping strategies most effective for dealing with traumatic events in the short and long term. Comparison of coping styles distinguishing distressed from non-distressed rail personnel exposed to a traumatic incidents could shed light on what these coping styles might be. Results could inform preventative training strategy but need to take into account individual coping style preferences.
- Identify the extent to which occupational fitness assessments rely on clinical judgement, and cross industry consistency in this practice.

4.3.3 Caveats

When considering the evidence generated by this review, the following caveats should be borne in mind:

1. Literature uncovered by this review is based on material obtained from publicly available sources. This may in part explain why weak evidence was accrued for TOC policies and procedures in relation to PTSD management, since such material is likely to remain at an “in house” level.

2. Likewise, the ranking system is both a reflection of the quality and volume of rail relevant material found relating to a given theme. Thus, a “weak” evidence conclusion does not mean that theme is not true. It may merely reflect lack of research in that area.

3. Lastly, the literature reviewed was confined to the rail industry and related areas (see method section). Therefore, the review reflects the current status of PTSD publicly available knowledge as applied to rail industry personnel rather than PTSD per se.

4.3.4 A good practice approach

Despite possible constraints surrounding the informative value of the literature used, recommendations for further improvements in the prevention and management of traumatic reactions in rail employees based on this review’s findings can still be made. Recommendations are split under policy and strategy categories. For the policy category, recommendations are listed in order of their potential impact on current resources, with more resource intensive suggestions appearing towards the end of the list. Each of the strategic recommendations is pitched at an industry-wide level, and, therefore, relate to longer-term change.


4.3.4.1 Policy

1. **Target:** The COCAS duty of care directive, with its two-pronged approach to prevention and care, remains a viable framework on which to base an approach. On the basis of this review any policy should, however, be applicable to all forms of psychological distress associated with rail trauma. This includes acute stress reaction, phobic avoidance, heightened anxiety as well as PTSD. The policy could also encompass an employee’s family and bystander witnesses.

2. **Duration:** To ensure continuing support, the policy should, in principle, be applicable for up to a year after the incident. Where appropriate, particular consideration could be paid to increasing support at the time of any inquest, and ensuring provision for accessing forgiveness from the family of the victim wherever viable.

3. **Sick leave:** To allow opportunity for natural recovery, affected employees should preferably be allowed opportunity to take an appropriate amount of time off work immediately following a traumatic event according to the severity of their reaction. To make this mandatory may remove employee autonomy. Nonetheless, an organisational norm should be instilled within a TOC in which premature return to make allowances potential delayed reaction.

4. **Aftermath:** Experiences particular to the immediate incident aftermath are likely to strongly affect longer-term recovery (Cook, 2001a). The support offered by the line manager may be crucial. Rail employees should, preferably, be given the option of continuing with the task in hand, going off-duty, or allowed “time out”. Given that the employee may not be fully rational at this stage, the line manager may have to reserve some discretion over their choice. What should be avoided is an employee’s continuing for fear of appearing “soft”, when still in a state of shock. Lone driving should also be avoided. If not already practiced either their line manager or other train personnel should preferably accompany the driver where having to complete a journey. This is particularly important when an incident occurs at night. Even so, the context surrounding a traumatic event may prevent compliance with a best practice approach. Pressures to minimise stoppage time, passenger complaints and staff shortages may force a driver to continue alone where they otherwise may choose not to.

5. **Buddy Support System:** Although not formally evaluated, the rationale underpinning buddy support systems is grounded in LUL’s experiences of delivering trauma care. Unless any formal evaluation concludes otherwise, the buddy support system should ideally be made available to all rail personnel shortly after involvement in traumatic incident. It should be offered on a voluntary basis. Corresponding staff making up the support system should comprise colleagues who have successfully recovered from similar episodes or who have an aptitude for delivering “psychological first aid”. Their inclusion should be contingent on having undergone a screening and training process. “Buddies” should be acquainted with the psychological boundaries within which they are expected to deliver help.

6. **Assessment/Screening:** Diagnosis ought, in principle, be based on a combination of self-report measures and clinical judgement, using a formula that is standardised across the rail industry. To avoid misdiagnosis, the decision should not be based on one source of evidence. The GHQ (anxiety sub-scale), IES and TSQ may represent a suitable combination of tools, given their application to rail-related samples. Where
simply evaluating the prevalence of PTSD, the TSQ in combination with IES or GHQ may suffice. Non-occupational health experts can administer both.

7. **Treatment:** The debriefing literature implicated natural support networks as more effective in facilitating recovery than formal treatment techniques. Therefore, care should be taken to ensure treatment is only delivered to those with inadequate support networks. As with the buddy support system, more formal psychological treatment should be offered on a voluntary basis. This is contingent on the extent to which the prevailing culture allows affected employees to come forward. To allow for any natural recovery, treatment should preferably not be delivered until 3 to 4 weeks’ post incident, unless otherwise requested by the employee, GP, family or manager. Affected employees can, however, be made aware of treatment provision shortly after the traumatic event. Use of structured techniques, such as EMDR and TIR will better enable cross-industry consensus on treatment approaches, and minimise any harmful effects generated by less experienced therapists. Treatment options should accommodate staff unable to cope with imagery-based techniques, such as EMDR and TIR.

4.3.4.2 **Strategy:**

1. **Monitoring:** Confidential industry wide monitoring of trauma event incidence, any consequent stress reactions and occupational health outcomes could provide more tailored solutions to the prevention and management of traumatic stress conditions.

2. **Culture:** Any harmful effects rail industry culture may have on employee recovery may be circumvented through active promotion of both the risks associated with rail related trauma and available support mechanisms. Promotion can be delivered during induction, technical training, leaflets and advertising. Any promotion strategy should also have management commitment. To enhance an inoculation effect, line managers, as well as “front” line staff should preferably undergo preventative training. Training should convey that trauma is a normal reaction, provide information regarding effective coping strategies and include “trauma experienced” colleagues in its delivery. Corresponding coping strategies should focus on pragmatic attitudes, “depersonalising” appraisals, perspective taking and engaging support.

3. **Occupational fitness:** Industry-wide consensus on process by which an occupational fitness decision is made, should, ideally, be established. Sole reliance on clinical judgement should be avoided wherever viable. To enable a more standardised approach, scores obtained from the diagnostic measures listed under “assessment/screening” could also contribute to the decision.

4. **Public Education:** Educating the public on the impact of their behaviour on rail employee welfare may reduce railway suicide attempts and public trespass as a source of PTSD. Any public education strategy could also include the possible role of passenger pressure for journey resumption, following a traumatic incident, in exacerbating rail personnel distress.
5 APPENDICES
## Appendix 1

### Prevalence, severity and consequences – page1

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sub topic</th>
<th>Anecdotal</th>
<th>Case studies</th>
<th>Expert opinion</th>
<th>Commissioned report</th>
<th>Formal study</th>
<th>Rail worker specific articles No.</th>
<th>N &gt; 75 rail workers</th>
<th>Quality rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Station staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
## Prevalence, severity and consequences – page 2

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sub topic</th>
<th>Anecdotal</th>
<th>Case studies</th>
<th>Expert opinion</th>
<th>Commissioned report</th>
<th>Formal study</th>
<th>Rail worker specific articles No.</th>
<th>N &gt; 75 rail workers</th>
<th>Quality rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic</td>
<td>Sub topic</td>
<td>Anecdotal</td>
<td>Case studies</td>
<td>Expert opinion</td>
<td>Commissioned report</td>
<td>Formal study</td>
<td>Rail worker specific articles No.</td>
<td>N &gt; 75 rail workers</td>
<td>Quality rating</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------</td>
<td>-------------</td>
<td>--------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>--------------</td>
<td>-----------------------------------</td>
<td>---------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>Negative attitudes</td>
<td>Nightingale and Williams (2000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
## Appendix 2a – Quality Rating

### Management – Page 1

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sub topic</th>
<th>Anecdotal</th>
<th>Case studies</th>
<th>Expert opinion</th>
<th>Report</th>
<th>Formal study</th>
<th>Rail worker specific articles No.</th>
<th>N &gt; 75 rail workers</th>
<th>Quality rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>link bet IES and GHQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chung et al (2003)</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>AIQ Accident</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Shelley et al (1997)</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Inventory Questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chuck et al (2003)</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Topic</td>
<td>Sub topic</td>
<td>Anecdotal</td>
<td>Case studies</td>
<td>Expert opinion</td>
<td>Report</td>
<td>Rail worker specific articles No.</td>
<td>N &gt; 75 rail workers</td>
<td>Quality rating</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------</td>
<td>--------------</td>
<td>----------------</td>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------</td>
<td>---------------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>Recent difficulties/events</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tranah and Farmer (1994)</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Trauma screening questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Brewin et al (2002)</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix 2b – Quality rating

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sub topic</th>
<th>Anecdotal</th>
<th>Case studies</th>
<th>Expert opinion</th>
<th>Commissioned report</th>
<th>Formal study</th>
<th>Rail worker specific articles No.</th>
<th>N &gt; 75 rail workers</th>
<th>Quality Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union recommendations</td>
<td>ASLEF (2004)</td>
<td>ASLEF</td>
<td></td>
<td></td>
<td>2.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topic</td>
<td>Sub topic</td>
<td>Anecdotal</td>
<td>Case studies</td>
<td>Expert opinion</td>
<td>Report</td>
<td>Formal study</td>
<td>Rail worker specific articles No.</td>
<td>N &gt; 75 rail workers</td>
<td>Quality rating</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------------------------</td>
<td>-----------</td>
<td>-------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>------------------------------------------------</td>
<td>----------------------------------</td>
<td>---------------------</td>
<td>-----------------</td>
</tr>
</tbody>
</table>
### Trauma Screening Questionnaire (TSQ)

#### Your own reactions now to the traumatic event.

Please consider the following reactions which sometimes occur after a traumatic event. This questionnaire is concerned with your personal reactions to the traumatic event which happened to you. Please indicate (Yes/No) whether or not you have experienced any of the following at least twice in the past week.

1. Upsetting thoughts or memories about the event that have come into your mind against your will.
2. Upsetting dreams about the event.
3. Acting or feeling as though the event were happening again.
4. Feeling upset by reminders of the event.
5. Bodily reactions (such as fast heartbeat, stomach churning, sweatiness, dizziness) when reminded of the event.
6. Difficulty failing or staying asleep.
7. Irritability or outbursts of anger.
8. Difficulty concentrating.
9. Heightened awareness of potential dangers to yourself and others.
10. Being jumpy or being startled at something unexpected.

(Brewin et al, 2001)
Appendix 4:

ASLEF leaflet ‘Advice on Fatalities and Distressing Situations’
Advice on Fatalities and Distressing Situations

ASLEF members may potentially be involved in a number of traumas in their course of their working lives. These may include being verbally or physically assaulted, being in a train crash, seeing a person die as a result of suicide or accident, and may occur while a member is driving the train.

Further, members may suffer loss after the death or injury of a work colleague, especially following a major incident such as Ladbroke Grove.

This leaflet gives practical advice on how Branch Secretaries and Representatives can assist members in coping with trauma and loss.

Checklist of action by Branch Secretaries/Representatives
- Ensure members report incident and state of health to management immediately following an incident.
  - Ensure management have access to any medical assistance immediately.
  - Ensure member is transported home safely and accompanied.
  - Ensure the member makes an appointment with their GP and seeks counseling.
  - Ensure member completes accident report form when feels able to do so.
  - Ensure member completes ASLEF accident schedule (yellow form).
  - Claims to the Criminal Injuries Compensation Authority (CICA) after a suicide or trespass on the track or an assault usually will not be permitted after two years, which is why the forms should be completed as soon as possible after the event.
  - Record incident with DSS on form 845, available from all DSS offices.
  - Log the incident in the Workplace Accident Book.

Coping with Trauma or Loss

This section was written by Ruth Harrison, who was the expert Forensic Social Work Consultant who gave assistance to the families of victims, and to the survivors, of the Ladbroke Grove crash, Hatfield and Peterborough. The wording is based on an agreed leaflet published by the Red Cross.

Ruth has given her assistance in producing this leaflet free of charge.

Donations to Child Victims of Crime would be appreciated, address below:
Child Victims of Crime, The Moat House, 133 Newport Road, Stafford ST16 2EZ. Tel: 01785 227 325.

Each experience is a personal one, but the facts below may assist your members in understanding some of the feelings and emotions that they may have.

Anger and rage
- at what has happened
- at the injustice and senselessness of it all
- at the shame and indignation
- at the lack of understanding by others
- at the inefficiencies of others
Sadness
● for losses of every kind

Guilt
● for making mistakes, surviving, for being alive

Memories
● of another, different life

Fear
● of harm to oneself, or those we love
● of being left alone, or having to leave loved ones
● of losing control
● of a similar event happening again

Helplessness
● feeling totally powerless

Longing
● for all that has gone

Shame
● for being exposed as helpless, emotional and needing others

Common reactions
Some common reactions are tiredness, tears, sleeplessness, recurring nightmares, memory loss, lack of concentration, dizziness, palpitations, difficulty in breathing, nausea, diarrhoea, changes in sexual interest, muscular tension which may lead to pain e.g. headaches, neck and back aches, abdominal pains, menstrual problems.

Numbness
Many who experience a traumatic event are numb by what has happened. The event may seem unreal, dreamlike, something that has not really happened and you may want to be on your own. People often see this wrongly as being uncaring, but everyone has different needs.

Reality
Life will never be the same and facing the future may be difficult but talking does help in difficult situations.
Children
• Tell children they are safe
• Keep in a routine
• Ask if they have any questions
• Be as open and honest as possible
Children should be encouraged to play and draw as this helps them express their feelings. Re-establish social support as soon as possible.

Gender
The way in which men and women react to stress is different. Men are practical and task centred and want to do something whilst women like to talk through their problems and deal with them in their own way. Neither is right or wrong. It is simply the way that men and women differ, but if this is misunderstood it can lead to communication difficulties.

Summary
Very little can make an immediate difference when life has changed unexpectedly and traumatically. But, talking to those around you concerning your thoughts, fears and worries and being honest about your needs can help in the early stages. It may not make it better but it will be less bad.

Other action to be taken by Branch Secretaries/Representatives
• If members are summoned to a Coroner’s Court to give evidence, they should immediately contact their District Secretary who will arrange for the member to be represented by ASLEF.
• Sometimes, due to the seriousness of the incident, ASLEF may provide a lawyer to accompany our members.
• It is important at all times to act promptly in our member’s interests, to inform the District Secretary and to seek assistance if required.
• The main point is to remember that our member will have gone through a bad time and may still be suffering the after effects.
• It is also important to keep in contact with the member if they are off work for any length of time.
• It is also important that the member seeks a counsellor trained to deal with trauma incidents, preferably organised by their own General Practitioner and not the TUC/UC Occupational Health Departments.
• No member should lose any money while off work due to traumatic incidents.
• Check that management is carrying out the Company Agreement on Care and Support Policy.

published by the
ASSOCIATED SOCIETY OF LOCOMOTIVE ENGINEERS AND FIREMEN
9 Arkwright Road, Hampstead, London NW3 6AB
020 7317 8600 Fax: 020 7794 6406 www.aslef.org.uk
Appendix 5: Chain of Care and Support Outline*

The COCAS system contains two elements, prevention and care:

- Prevention is achieved by promoting awareness of the preparedness for events (such as being assaulted at work, or witnessing ‘rail suicides’) that may arise during the course of employment. This includes educating employees about their potential emotional reactions to these events and an understanding of the employee support system.
- Care incorporates the arrangements and responsibilities for post-incident support for employees. This includes ascertaining whether an employee is fit to continue work after their involvement in such events, relief and transport home as needed, debriefing by a trained person and on-going support and subsequent referral to a specialist help as determined by the needs and wishes of the employer.

The ‘chain of care’ in the policy describes the stages or links in the supporting process following an incident. For example: a line manager who holds key responsibility for the management of an employee, a trained resource which can offer effective debriefing and, where needed, further referral onto specialist help.

Individual rail company arrangements for COCAS may differ in detail and approach. However, fundamental to the credibility of such procedures are support for the employee by his/her line manager and an effective debriefing system.

The suggested intervention of a debriefing session is within 72 hours of the incident having occurred.

*Taken from RSSB (2003) SOVRN report
6 REFERENCES


Huber, M., Siol, T., Herholz, K., Lenz, O., Kohle, K. and Heiss, W.D. (2001) Activation of
talamo-cortical systems in post traumatic flashbacks: A positron emission tomography study.
Traumatology. 7 (4) p131-141.

International Labour Organisation.


effect of major railway accidents on the psychological health of train drivers–II. A longitudinal
study of the one-year outcome after the accident. Journal of Psychosomatic Research. 37 (8)
p807-817.

Topics. August 27 p9.


perspective. Primary Care Psychiatry. 5 (3) p89-100.

Interview (MINI). A short diagnostic structured interview: reliability and validity according to
the CIDI. European Psychiatry. 12 p224-31.


LUL (2003) *LUL railway safety case version 3.22 (section 21).* LUL


The Railways (Safety Critical Work) Regulations (RSCWR) (1994) cited in the


