Brief for Institution of Occupational Safety and Health

An overview of the role of the Rail Accident Investigation Branch (RAIB)

Mark Turner, Inspector of Rail Accidents
22 October 2014
Accident investigation
Learning from experience

- The railway has learnt many hard lessons from accidents
- Many significant improvements can be traced back to particular events, eg:
  - 1952 Harrow; accelerated the introduction of the automatic warning system (AWS)
  - 1975 Moorgate; train stops on the approach to dead-end platforms
  - 1988 Clapham Junction; improved crashworthiness of rolling stock
  - 1991 Cannon Street; alcohol and drug testing
- Then, in the late 1990s…
Accidents from late 1990s

- Southall, Aug 1997 – Cause: signal passed at danger (SPAD)
  - Outcome: side collision (101-115 mph); 6 fatalities, 160 injuries
- Ladbroke Grove, Oct 1999 – Cause: SPAD
  - Outcome: head on collision (130 mph); 31 fatalities, > 500 injuries
- Hatfield, Oct 2000 – Cause: track failure
  - Outcome: derailment (115 mph); 4 fatalities, 70 injuries
- Selby (Great Heck), Feb 2001 – Cause: collision with a Land Rover
  - Outcome: derailment and head on collision (130 mph); 10 fatalities, 82 injuries
- Potters Bar, May 2002 – Cause: points failure
  - Outcome: derailment (97 mph); 7 fatalities, 11 injuries
- Tebay, Feb 2004 – Cause: gross negligence in trolley maintenance
  - Outcome: trolley runaway, carrying 16 tonnes of steel (40 mph); 4 fatalities, 3 injuries
- Ufton Nervet, Nov 2004 – Cause: collision with car at level crossing
  - Outcome: derailment (97 mph); 7 fatalities, approx. 100 injuries
Common issues

- Because of fatalities, sites declared scenes of crime
- Large amounts of debris / evidence
- Many derailed vehicles
- Evidence had to be collected to satisfy both the police and HSE requirements
- A requirement for minimal damage during recovery operations
- Important rail routes blocked
- Long time before investigation reports published, because of the legal issues involved
- Reluctance of involved people to give evidence
Why was the RAIB established?

- The public inquiry into the 1999 Ladbroke Grove accident recommended that an independent organisation should be established to investigate rail accidents
  - This should be independent of government, safety regulators, police and all industry parties
- UK legislation:
  - Railways and Transport Safety Act 2003
  - Railways (Accident Investigation and Reporting) Regulations 2005
    - Guidance for the use of the Regulations is published by the RAIB (www.raib.gov.uk)

- Each Member State shall ensure that investigations of accidents and incidents ... are conducted by a permanent body ... able to perform the function of investigator-in-charge in the event of an accident or incident. This body shall be independent in its organisation, legal structure and decision-making.
- ... Its investigators shall be afforded status giving them the necessary guarantees of independence.
The RAIB – Key facts

- Independent from all parts of the rail industry
  - Forms a part of the Department for Transport, although is functionally independent
  - Chief Inspector reports to Secretary of State on investigation matters
- Sole purpose to improve safety
  - Does not apportion blame or liability
- Acts as the lead party in most investigations
- Became operational in October 2005
RAIB’s scope includes:
Mainline, metros, trams and heritage rail
What types of accidents are investigated?

- Where the RAIB decides there is potential for safety lessons to be learned and:
  - The death of at least one person
  - Serious injury to five or more people
  - Extensive damage to rolling stock, infrastructure or the environment
  - Any other accident which could have had one of these consequences under slightly different circumstances

Discretion to investigate other incidents based on:
- how serious the incident is; and
- extent of likely safety lessons to be learned

Including trends of accidents/incidents
What type of accidents are **not** investigated?

Worker accidents /incidents with the exception of those involving train movements

Accidents /incidents involving trespassers or suicides
England: Freight train derailment at Cricklewood
Northern Ireland: Derailment at Cromore
Scotland: Freight train derailment at Carrbridge
Wales: Fatal shunting accident on the Gwili Railway
France: Channel Tunnel fire
Accidents involving passenger trains...
... freight trains ...
… London Underground …
... tramways and ...
... heritage railways
Investigation techniques

- Witnesses
- Site surveys of infrastructure and vehicles
  - Witness marks (damage)
- Documents – standards & real time records
- Analysis of recorded data
  - Data recorders (signalling / trainborne)
  - CCTV
- Historic records/statistics
- Testing
- Reconstruction
Our guiding principles when undertaking investigations (1)

- Independence
- Accuracy
- Proportionality
- Cost effectiveness
- Timeliness
- Consistency
- Traceability of evidence
Our guiding principles when undertaking investigations (2)

- Sharing of evidence where appropriate
- Confidentiality where required
- Logically supported recommendations
- Industry and safety authority buy-in so far as is possible
- Required liaison and consultation
- Keeping the injured and bereaved informed
- Clear report suitable for a wide target audience
The benefits of accident investigation (1)

- In depth analysis of the causal chain gives insights into the contributions from:
  - Machines
  - Infrastructure
  - People
  - Organisational factors
- Many of the accidents investigated by the RAIB were not predicted by any formal techniques applied by designers, maintainers or operators
- Most investigations reveal how combinations of factors combined to create a dangerous event
The benefits of accident investigation (2)

- Investigations highlight the vulnerability of existing risk mitigation measures and assist the design of new measures
- Investigations shine a searchlight into particular corners of the railway industry
  - They therefore provide valuable intelligence to those with the responsibility for safety
- Investigations demonstrate to those involved, those affected and wider society that action is being taken and lessons will be learnt
RAIB’s staff

- Chief Inspector
- Deputy Chief Inspector
- 5 Principal Inspectors
- 19 Inspectors
- Admin support
RAIB’s operation

Two operational centres

Vehicles and workshops at both centres

On call roster includes staff at both locations
The Wharf, Derby
Notification & deployment

- RAIB notified
  - A legal requirement, and immediately for specified categories of incidents
- RAIB Duty Co-ordinator decides action
- Inspectors deployed to site as necessary
  - Inspectors on call 24/7
  - Aim to be on road 30 mins from call
- Accredited Agent deployed
  - ~ 370 industry staff
- RAIB Duty Co-ordinator
  - remains prime contact until inspectors arrive on site
- RAIB conducts preliminary examination
### RAIB’s powers

The RAIB Inspectors have the power to...

<table>
<thead>
<tr>
<th>Power Description</th>
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</thead>
<tbody>
<tr>
<td>Enter all railway property, land and vehicles</td>
</tr>
<tr>
<td>Seize anything relating to the accident and make records</td>
</tr>
<tr>
<td>Require access to and disclosure of records and information including telephone / medical / staff records</td>
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<tr>
<td>Require people to answer questions and provide information about anything relevant to the investigation</td>
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</table>
Accredited Agents

In more remote locations, RAIB Inspectors may take some time to reach an accident

Accredited Agents are railway industry personnel, approved by RAIB

Accredited Agents do not investigate

Until the RAIB arrives on site Accredited Agents:

- Record perishable evidence - but not touch or remove it
- Ensure that important evidence is protected
- Provide a situation brief to the Duty Co-ordinator
How we investigate: working with other parties including the police and safety regulator
Other parallel investigations:
Co-operation and sharing of evidence

RAIB will not share witness statements or witness identity

Industry parties’ investigations

RAIB
Safety Investigation

Factual evidence may be shared

RAIB

ORR
Enforcement of safety legislation

Police and CPS
Criminal prosecution & sudden death investigation
Memorandum of Understanding (MoU)

Signatories:
- Association of Chief Police Officers
- Association of Chief Police Officers (Scotland)
- Crown Office and Procurator Fiscal Service
- British Transport Police
- Office of Rail Regulation
- Rail Accident Investigation Branch

Signed by all parties in December 2005

Sets out principles for liaison, cooperation and communication between parties
How does this work?

RAIB leads the investigation unless:

- There is evidence that a criminal act caused the accident/incident
- Criminal investigation normally will take precedence (eg terrorist incident or vandalism)
- Police and the RAIB are required to agree if the Police investigation is to take precedence

The RAIB will still have access to the site and evidence, and may still conduct a safety investigation
Investigation milestones

- Preliminary examination review (internal)
- Remit (shared with industry)
- Periodic and event driven reviews
  - Investigation manager / DCI / CI
- Reviews with industry as required
  - Including safety authority and police
- Final analysis review
  - Typically @ T+25 weeks
- Pre-consultation meetings with industry once report drafted
- Formal consultation with involved parties
  - Typically starts @ T+42 weeks
- Publication
  - Typically @ T+50 weeks
RAIB’s outputs

- Investigation report
  - Detailed report explaining and analysing the accident or incident, with recommendations to improve safety
- Safety Bulletin
  - Brief report to enable an understanding of the particular circumstances and learning points from a specific event
  - Used when RAIB is not conducting a full investigation
- Urgent Safety Advice (USA)
  - Provides immediate information to relevant industry bodies about safety issues identified during an investigation
- Factual summary note
  - Summary note of the key facts for the Coroner or Procurator Fiscal
  - Used when there has been a fatality and RAIB is not conducting a full investigation due to the specific circumstances
# RAIB statistics 2005 – 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Notifications</th>
<th>Deployments</th>
<th>Preliminary examinations</th>
<th>Investigations started</th>
<th>Reports published</th>
<th>Bulletins published</th>
<th>USAs published</th>
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<td><strong>306</strong></td>
<td><strong>250</strong></td>
<td><strong>223</strong></td>
<td><strong>39</strong></td>
<td><strong>27</strong></td>
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</table>
Investigations completed to August 2014

- Mainline, 207
- London Underground, 12
- Channel Tunnel, 3
- Heritage, 25
- Light rail (trams), 26
- Northern Ireland, 6
- Metro (eg DLR, Tyne & Wear), 4
Collisions (with obstacles, other trains and out of gauge), 15
Signal passed at danger, 1
Failure of signalling system, 1
Near misses (excluding level crossings), 3
Possession irregularity, 1
Class investigations: (earthworks failures, broken rails and safety at AOCLs), 3
Train defects, 3
Infrastructure failures, 7
Runaway incident, 7
Derailments (passenger & freight), 18
Train movement accidents (involving staff, passengers & public), 16
Level crossing accidents (including near misses), 24
RAIB is advised by the safety authority whether it or the railway industry will implement the recommendations.

The railway industry notifies the safety authority of its intent whether to implement the recommendations.

The safety authority informs relevant industry parties of the recommendation and requirements to report response.

RAIB publishes report • sends to those involved • addresses recommendations to the safety authority and other relevant public bodies and member states.

The railway industry has a duty to consider the recommendations.

RAIB recommendations are formulated with input from industry.

RAIB is advised by the safety authority whether it or the railway industry will implement the recommendations.
Status of recommendations (January 2014)

- Implemented: 79%
- Implemented by alternative means: 1%
- Implementation in progress and ongoing: 14%
- Awaiting response: 3%
- Non-implementation: 3%

Of those recommendations that have reached a conclusion, 97% have been implemented.
‘People need to know that accidents have been thoroughly investigated and that actions have been taken so they don’t happen again’