



Using our brains to save and improve the lives of workers

## Potters Bar Rail Crash

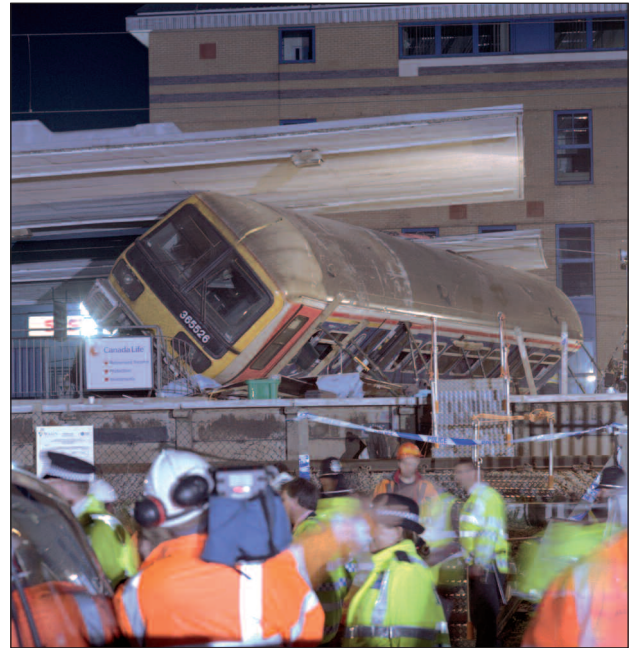


## The Client

Health and Safety Executive (HSE)(now Office of Rail  
Regulation(ORR))  
British Transport Police (BTP)

## The Problem

A major accident occurred on 10 May 2002 when a Networker Express train travelling from Kings Cross to Kings Lynn derailed approximately 160m south of Potters Bar station. The rear (fourth) vehicle of the train became detached from the rest of the train, slid up the platform slopes and eventually came to rest transverse to the tracks and under the station canopy. Seven people were killed and many others were injured during the incident.



## What we did

HSL was contacted about 2 hours after the accident and a team of engineering investigators was sent immediately to the scene where they began an investigation under the joint control of HMRI and BTP. Attention quickly focussed on point 2182A south of the station which was clearly in a fault condition and it was evident that the malfunction of this points had led to the derailment. Nine other points in the vicinity of Potters Bar were also examined and were found to exhibit similar, although less serious, defects.

With the assistance and advice from rail industry personnel, point 2182A, weighing approximately 15 tonnes, was detached from the rails by thermal cutting and transported to HSL where it underwent detailed metallurgical examination and series of mechanical tests to assess its performance.

In addition, the performance of the four rail vehicles leading up to and during the incident was studied. Their external condition and crashworthiness was assessed and vehicle dynamics studies were carried out to explain the behaviour of the vehicles during the incident. A limited programme of vibration testing was performed to assist in understanding the loosening of the nuts on the point.

It was concluded that four main factors contributed to the failure of the point, these were: the poor condition of the backdrive; the loss of nuts from the right-hand end of the rear stretcher bar; the loss of nuts from the left-hand end of the front stretcher bar and the fracture and disengagement of the lock stretcher bar. The point failed in such a manner that the train was being pulled into a reducing gap between the switch rails, resulting in some of the wheels climbing over the rails and eventual derailment of the rear end of the train.

## Outcome/Benefits

HSL's findings were reported in the various reports issued by the Major Incident Inquiry Board and a number of presentations were made to interested parties. A possible generic problem with the set-up of the points was identified at an early stage of the investigation and this was communicated immediately to the industry. As a result of this work, the industry introduced a Good Practice Guide with aim of prevented other accidents being caused by the failure of this type of point.