

THE PENNSYLVANIA RAILROAD SYSTEM



INFORMATION



FOR EMPLOYEES AND THE PUBLIC

Broad Street Station
PHILADELPHIA, PA.

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Pennsylvania Station
PITTSBURGH, PA.

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Getting at—and Removing—the Causes of Railroad Accidents

Mr. R. H. Newbern, Superintendent of the Insurance Department of the Pennsylvania Railroad System, on October 15th, addressed the National Council for Industrial Safety on the safety problem of railroads, and the value of comprehensive statistics in safety work. Mr. Newbern said:

On the Pennsylvania System, employing normally over 225,000 men and carrying over 185 million passengers and with a freight movement exceeding 385 million tons annually, there are 60,000 reports of accidents to employes and 10,000 reports of injuries to passengers and others forwarded to the Company's Insurance Department. In order to simplify the handling of this large number of reports, the "Hollerith" system was adopted and a code prepared showing causes, nature of injuries, occupations, locations, days disability and other items of information necessary in the analysis of accidents.

As the reports are received they are codified, each item of information being marked with its designated code number, and a permanent

record of the accident is transferred to a card by means of a punching machine.

When statements or data are needed for the information of the Executive or Operating Department or for the guidance of the Safety organization, the cards are sorted by means of machines and the desired information obtained quickly, accurately and economically.

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What the Statistics Show

For statistical purposes employes are separated into two classes, one, employes in the maintenance of equipment, commonly known as Shopmen, and the other, all other employes, such as Trainmen, Maintenance of Way men, Station men, etc., designated as Road and Yard men.

The statistics provide for the following information :

The number killed and injured by

Detailed causes.

Nature of injury by cause and occupation.

Length of disability.

Occupations.

Length of service.

Time of day or night.

Weather conditions.

Division.

Grand Division.

Shops.

Large stations and yards.

The statistics are compiled on the same basis for Shop and Road and Yard accidents, excepting as to detailed causes, there being 360 Shop causes and 340 Road and Yard causes, making 700 separate causes of accidents. The causes in turn are classified under 36 General Headings which indicate the nature of the work at time of accident. These General Headings are as follows :

Accident Causes in Shops

Operation of machines and working of material.

Repairing locomotives.

Repairing cars.

Handling and use of hand tools.

Handling and use of jacks.

Handling material.

Trucking material.

Tools and material falling.

Working around turntables, coal docks, ash pits.

Operation of cranes, hoists and other devices.

Obstruction and material in aisles, passages and footways.

Defective floors and footways.

Erection of scaffolds and working on same.

Ladders.

Electrical.

Handling ice.

Getting on or off engines or cars at rest.

Getting on or off engines or cars in motion.

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Accident Causes on the Road and in Yards

Getting on or off engines or cars at rest.

Getting on or off engines or cars in motion.

Setting and releasing hand brakes.

Coupling and uncoupling cars or engines.

Connecting and disconnecting steam and air hose, including operating angle cock.

Accidents on or around locomotives.

Operating switches.

Handling baggage and mail and baggage trucks.

Falling in ash, turntable and inspection pits.

Slipping or tripping on coal wharves, platforms, walks and bridges.

Working on or around engines, cars or train.

Crossing or walking in yards or on tracks or bridges to and from work.

Insufficient clearances.

Constructions around tracks and in yards.

Loading, unloading and handling freight, etc., at freight and transfer stations.

Working on or around tracks and buildings, including loading and unloading.

By comparing the number of accidents under each General Heading, we ascertain what kind of work is the most hazardous and the specific cause under which the accidents are reported. The primary cause of every accident is indicated. The records are kept by Divisions, Shops, Stations and Yards, and it is, therefore, easily seen at what points any particular kind of accident is most frequent.

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Some Things the Statistics Bring Out

There are included in the statistics additional information bearing an important relationship to accident frequency, such as

the average age of employes, length of service, etc.

Regarding the length of service, it was found that during the year 1913 there were 90,000 new men employed, although the total increase in the number of employes for the year was less than 9000, the greater number of transient employes being in the Maintenance of Way Department. The statistics developed the fact that during the year 25 per cent. of the men killed and injured had less than six months' experience and that 28 men were killed and 2391 injured who had been in the service less than 30 days.

Assuming a similar experience on all the other railroads of the United States, at least 360 men were killed and 15,000 injured last year having less than one month's experience, and many met death during their first week's work—not because they were careless or fool-hardy, but because they were ignorant of the hazards of the work.

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Education an Important Feature of Safety Work

It is recognized that the education of employes is one of the most important features in safety work, but the large number of transient men make this educational feature a difficult problem. Experience also indicates that a greater effort should be made to instruct the new man as to the hazards of his occupation before he is permitted to be placed in a hazardous position.

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A business employing men in more than 100 occupations will be unable effectively to teach the doctrine of safety unless some means are provided to discover the number of injuries sustained by men in each specific occupation. The statistics, therefore, are so arranged that the number of injuries and fatalities can be shown in each department and to each occupation of the various departments, also the reports are tabulated to

show the specific cause for each occupation. This detailed information will of itself suggest definite instructions along safety lines.

The number of accidents occurring during each hour of the day or night is shown as the time of the accidents suggests various preventives, such as improved lighting facilities and rearrangement of working hours.

Statistics Show Exact Time Lost by Employes

A statement of so many men injured on railroads during a certain period does not convey a proper meaning; it is the loss of time that shows what the employe really suffers. Therefore, the statistics provide for the number killed, the number injured, the number of indefinite injuries and the actual number of days lost.

Our statistics include all accidents resulting in a disability of one day and over. It was found that 18 per cent. of all the injuries involved less than 4 days' disability, and the number of "15 days or over" accidents (the minimum period covered by liability laws) amounted to 50 per cent. of the total days' disability.

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Classifying 141 Kinds of Injuries

Our statistics also show the nature of the injury; this information embodies 141 different kinds of injuries, included under the following General Headings:

Amputation	Fractures
Eye Injury	Electrical Shocks
Sprains and Strains	Burns
Bruises	Dislocations
Incised Wound or Laceration	

This information enables the management to study methods of treatment to reduce the length of disability. Take the subject of fractures for example: There were 758 cases last year, resulting in 19,190 days of disablement, 87 indefinite disability

cases and 53 fatalities. The medical profession recognizes the necessity for the best treatment of these injuries, as fractures may result in extended disablement on account of improper treatment.

What Accident Statistics Are Worth

The value of accident statistics depends largely upon the remedial action they suggest, and the Safety Inspectors, by analyzing these statistics, become familiar with all the hazards of operation, and such knowledge has been found invaluable in inspection work.

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Statistics also form an important feature in the operation of a safety organization, based on the theory that what has happened is a reliable indication of what will happen. They are also valuable on the educational side of the question, as they show each man the causes responsible for accidents in his particular line of employment, and it is the practice to attach to all inspection reports statistics of all accidents occurring at the points covered by the inspection.

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Our experience clearly indicates that comprehensive accident statistics furnish a most effective means of suggesting remedial measures in accident prevention work.

Here is a real result of this Company's efforts steadily to reduce the number of accidents of all kinds:

In the first six months of this year there were 23 per cent. less fatalities and 30 per cent. less injuries to Pennsylvania Railroad employes than in the first six months of 1913.