

Type of signal systems in service as of January 1, 1964

| Type of signal protection | Plants | Miles of— | | Locomotives |
|--|--------------|----------------|----------------|--------------|
| | | Road | Track | |
| Block-signal systems: | | | | |
| Automatic..... | | 80,687 | 106,022 | |
| Nonautomatic..... | | 22,537 | 22,542 | |
| Total..... | | 103,224 | 128,564 | |
| Corresponding totals, Jan. 1, 1963..... | | 103,140 | 129,082 | |
| Interlocking..... | 3,598 | | | |
| Automatic train-stop, train-control, and cab-signal devices: | | | | |
| Train-stop..... | | 9,115 | 13,334 | 4,678 |
| Train-control..... | | 1,018 | 1,984 | 1,064 |
| Cab-signal..... | | 3,981 | 8,207 | 3,648 |
| Total..... | 3,598 | 14,004 | 23,475 | 9,387 |
| Corresponding totals, Jan. 1, 1963..... | 3,776 | 14,133 | 23,574 | 9,362 |

Applications for signal modifications requested of ICC

BLOCK SIGNAL

| Period | Number filed | Pending at beginning of year | Acted upon | Withdrawn | Pending at close of year |
|----------------|--------------|------------------------------|------------|-----------|--------------------------|
| Year 1960..... | 244 | 70 | 261 | 3 | 60 |
| Year 1961..... | 231 | 60 | 238 | 2 | 51 |
| Year 1962..... | 232 | 51 | 237 | 0 | 46 |
| Year 1963..... | 218 | 46 | 209 | 0 | 55 |
| Year 1964..... | 220 | 55 | 212 | 0 | 63 |

RULES, STANDARDS, AND INSTRUCTIONS

| Year | Number filed | Pending at beginning of year | Acted upon | Withdrawn | Pending at close of year |
|----------------|--------------|------------------------------|------------|-----------|--------------------------|
| Year 1960..... | 82 | 19 | 77 | 1 | 23 |
| Year 1961..... | 55 | 23 | 76 | 0 | 2 |
| Year 1962..... | 17 | 2 | 13 | 0 | 6 |
| Year 1963..... | 30 | 6 | 26 | 0 | 10 |
| Year 1964..... | 33 | 6 | 32 | 0 | 7 |

Bureau of Safety inspections made during year ended June 30, 1964

| System | Number of systems inspected | Including inspections of— | | | | Records of tests |
|------------------------------|-----------------------------|---------------------------|---------------|------------------|------------------------|------------------|
| | | Signals | Switches | Other appliances | Devices on locomotives | |
| Automatic block-signal..... | 830 | 8,765 | 7,078 | 1,468 | — | 20,289 |
| Interlockings..... | 2,075 | 14,673 | 10,715 | 10,589 | — | 21,127 |
| Traffic-control..... | 1,064 | 9,817 | 6,227 | 5,147 | — | 18,778 |
| Automatic train-control..... | 53 | — | — | 90 | 174 | 263 |
| Automatic train-stop..... | 565 | — | — | 2,670 | 1,559 | 5,124 |
| Automatic cab-signal..... | 291 | — | — | 772 | 1,713 | 3,991 |
| Total..... | 4,879 | 34,255 | 24,020 | 20,746 | 3,446 | 69,482 |

Accidents at highway grade crossings for year ended December 31—

| Accidents and casualties | 1961 | | 1962 | | 1963 | | | | |
|---|--------|-------------------|------------|--------|-------------------|------------|--------|-------------------|------------|
| | Number | Number of persons | | Number | Number of persons | | Number | Number of persons | |
| | | Killed | Injured | | Killed | Injured | | Killed | Injured |
| Accidents at highway grade crossings..... | 3,204 | 1,291 | 3,514 | 3,149 | 1,241 | 3,192 | 3,373 | 1,302 | 3,524 |
| Accidents at highway grade crossings involving motor vehicles..... | 2,914 | 1,168 | 3,298 | 2,920 | 1,122 | 3,075 | 3,169 | 1,208 | 3,416 |
| Derailments of trains at highway grade crossings involving motor vehicles..... | 54 | 25 | 182 | 57 | 36 | 68 | 66 | 25 | 115 |
| Miscellaneous train accidents as a result of collision between trains and motor vehicles..... | 184 | 96 | 99 | 199 | 106 | 106 | 185 | 70 | 96 |
| Railroad casualties: | | | | | | | | | |
| Passengers..... | | 1 | 154 | | 1 | 73 | | | 61 |
| Employees on duty..... | | 9 | 133 | | 17 | 116 | | 3 | 160 |
| Total..... | | 10 | 287 | | 18 | 189 | | 3 | 221 |

1 Passenger automobiles, buses, and trucks.

Signal failures reported by ICC

Something new has been added to the Bureau of Safety's annual report for the year ended June 30, 1964. Specifically, the ICC's Section of Railroad Safety report has included tables on methods of train operation, number and kinds of interlockings, and miles of road and track and units of rolling stock equipped with ATS, ATC and/or ACS. Formerly, this material was published in a separate report.

When reporting on applications for approval of modifications of block signals and interlockings, the Bureau report noted that "public hearings were held on 24 applications. . . . Public hearings were held on four applications for relief from the requirements of the rules, standards and instruction."

Continuing, the report stated: "During the year four petitions were filed for relief from the requirements of section 136.587 of the rules, standards and instructions, and three petitions were filed seeking relief from the Commission's order No. 13413. At the beginning of the year, two petitions were pending; eight were acted on during the year; and at the close of the year one petition was pending."

Regarding inspections of signal systems, the report noted: "These inspections have resulted in bringing to the attention of the railroad managements, for necessary corrective action, a number of unsatisfactory maintenance conditions which have been found to exist. The 4,879 systems inspected during the year is an increase of 634 systems inspected over the previous year.

"In the year ended June 30, 1964, 28 complaints were received in connection with alleged violations of the rules, standards and instructions. At the beginning of the year, action was pending on four complaints pre-

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BUREAU OF SAFETY REPORT

Signal Failures as of June 30—

(Continued from page 20)

viously filed. During the year investigations were completed on 26 and action was pending on 6 at the end of the year.”

The table at the top of this page has been compiled from Bureau of Safety reports of previous years. For those who do not have this year's report, the following may be of interest: Number and kinds of interlockings in service as of Jan. 1, 1964 includes 844 automatic interlockings, 765 electric plants, 167 electro-mechanical, 323 electro-pneumatic, and 551 mechanical plants. Of the remotely controlled type, there are 832 electric plants and 116 electro-pneumatic. The total number of interlockings is 3,598. Traffic controlled points are listed as follows: 8,578 electric and 339 electro-pneumatic. **RS&C**

| | 1964 | 1963 | 1962 | 1961 | 1960 |
|------------------------------------|--------|--------|--------|--------|--------|
| False restrictive failures | 28,456 | 27,173 | 27,047 | 23,884 | 25,625 |
| False proceed failures | 58 | 65 | 65 | 56 | 73 |
| Potential false proceed conditions | 9 | 14 | 3 | 7 | 11 |

Signal Installations as of January 1—

| | 1964 | 1963 | 1962 | 1961 | 1960 |
|--|---------|---------|---------|---------|---------|
| Track miles of train operation by signal indication without train orders | 40,670 | 39,918 | 38,264 | 35,997 | 34,009 |
| Track miles of automatic block signaling | 106,022 | 106,695 | 107,562 | 108,587 | 109,133 |
| Traffic control points | 8,917 | 8,731 | 8,432 | 7,854 | 7,357 |
| Number of interlockings | 3,598 | 3,776 | 3,939 | 4,028 | 4,089 |
| Automatic train stop | | | | | |
| Miles of track | 13,334 | 13,445 | 14,345 | 14,664 | 14,712 |
| Rolling stock equipped | 4,675 | 4,802 | 4,750 | 5,036 | 5,007 |
| Automatic train control | | | | | |
| Miles of track | 1,934 | 1,937 | 1,945 | 1,933 | 1,933 |
| Rolling stock equipped | 1,064 | 1,002 | 1,128 | 858 | 859 |
| Automatic cab signaling | | | | | |
| Miles of track | 8,207 | 8,493 | 8,222 | 8,311 | 8,353 |
| Rolling stock equipped | 3,648 | 3,588 | 3,556 | 3,430 | 3,413 |

Causes of false-proceed failures reported by carriers for year ended June 30, 1964

| Name of railroad | Sand, rust, or other deposit on rails | Failure of relays and similar devices | Circuits open, crossed or grounded, foreign current etc. | Apparatus broken, defective, or out of adjustment | Failure of apparatus due to ice, sleet, snow, wet track, weather, or lightning | Failure of apparatus due to obstruction | Errors in making connections or adjustments | Undetermined | Total |
|---|---------------------------------------|---------------------------------------|--|---|--|---|---|--------------|-------|
| Atchison, Topeka & Santa Fe..... | | | 3 | 2 | 2 | | 3 | | 10 |
| Atlantic Coast Line..... | | | | | | 1 | | | 1 |
| Bessemer & Lake Erie..... | 1 | | | | | | | | 1 |
| Boston & Maine..... | | | | | 2 | | | | 2 |
| Central of Georgia..... | | | | 1 | | | | | 1 |
| Central R. R. of New Jersey..... | | | 1 | | | | | | 1 |
| Chesapeake & Ohio..... | | | | | | | 1 | | 1 |
| Chicago & North Western..... | | | 1 | 1 | | 1 | 1 | | 4 |
| Chicago, Burlington & Quincy..... | | | 1 | | | 1 | | | 2 |
| Chicago, Milwaukee, St. Paul & Pacific..... | | | | 1 | 1 | | | | 2 |
| Denver & Rio Grande Western..... | | 1 | | | | | | | 1 |
| Elgin, Joliet & Eastern..... | | | | | | | 1 | | 1 |
| Erie-Lackawanna..... | | | 1 | | | 1 | 1 | | 3 |
| Grand Trunk Western..... | | | 1 | | | | | | 1 |
| Gulf, Mobile & Ohio..... | | | | | | | 1 | | 1 |
| Illinois Central..... | | | 1 | 1 | | | | | 2 |
| Louisville & Nashville..... | 1 | | 1 | | | | | | 2 |
| Missouri Pacific..... | | | | | | | 1 | | 1 |
| Monon..... | | | | | 1 | | | | 1 |
| New York Central..... | | | | | 2 | | | 1 | 3 |
| New York, Chicago & St. Louis..... | | | | 1 | | | | | 1 |
| Northern Pacific..... | | 1 | | | 2 | | | | 3 |
| Pennsylvania..... | 1 | | 1 | 3 | | | | 1 | 6 |
| Port Authority Trans-Hudson..... | | | | 1 | | | | | 1 |
| St. Louis-San Francisco..... | | | | 1 | | | | | 1 |
| Southern Pacific..... | | 1 | | 1 | | | | 1 | 3 |
| Washington Terminal..... | 2 | | | | | | | | 2 |
| Total..... | 5 | 3 | 11 | 13 | 10 | 4 | 9 | 3 | 58 |

Causes of potential false-proceed conditions reported by carriers for the year ended June 30, 1964

| Name of railroad | Sand, rust, or other deposit on rails | Failure of relays and similar devices | Circuits open, crossed or grounded, foreign current etc. | Apparatus broken, defective, or out of adjustment | Failure of apparatus due to ice, sleet, snow, wet track, weather, or lightning | Failure of apparatus due to obstruction | Errors in making connections or adjustments | Undetermined | Total |
|--|---------------------------------------|---------------------------------------|--|---|--|---|---|--------------|-------|
| Atlantic Coast Line..... | | | | 1 | | | | | 1 |
| Central of Georgia..... | | | | | | 1 | | | 1 |
| Chesapeake & Ohio..... | | | 1 | | | | | | 1 |
| Cincinnati, New Orleans & Texas Pacific..... | | | | | | | | 1 | 1 |
| Elgin, Joliet & Eastern..... | | | | | 1 | | | | 1 |
| Pennsylvania..... | | | 1 | | | | | | 1 |
| Soo Line..... | | | | 1 | | | | | 1 |
| Southern Pacific..... | | | 1 | | | | | 1 | 2 |
| Total..... | 0 | 0 | 3 | 2 | 1 | 1 | 0 | 2 | 9 |

| YEAR ENDED 6-30-64 | False restrictive failures | | | | | False proceed failures | | | | | Potential false proceed conditions | | | | | |
|--|----------------------------|---------------|--------------|-------------|---------------|------------------------|---------------|--------------|-------------|---------------|------------------------------------|---------------|--------------|-------------|---------------|-------|
| | Name of railroad | Block systems | Interlocking | ATS-ATC ACS | Other systems | Total | Block systems | Interlocking | ATS-ATC ACS | Other systems | Total | Block systems | Interlocking | ATS-ATC ACS | Other systems | Total |
| Alabama Great Southern | 49 | 79 | 7 | 1 | 136 | | | | | | | | | | | |
| Alton & Southern | 5 | 17 | | | 22 | | | | | | | | | | | |
| Ann Arbor | 2 | 2 | | | 4 | | | | | | | | | | | |
| Arkansas & Memphis Ry. Bridge & Terminal Co. | | 4 | | | 4 | | | | | | | | | | | |
| Atchison, Topeka & Santa Fe | 366 | 581 | 200 | | 1,147 | 6 | 4 | | | 10 | | | | | | |
| Atlanta & West Point | 25 | | | | 25 | | | | | | | | | | | |
| Atlanta Terminal | | 6 | | | 6 | | | | | | | | | | | |
| Atlantic Coast Line | 314 | 304 | 157 | 22 | 797 | | 1 | | | 1 | | | | | 1 | |
| Baltimore & Ohio | 481 | 385 | 125 | | 991 | | | | | | | | | | | |
| Baltimore & Ohio Chicago Terminal | 13 | 90 | | | 103 | | | | | | | | | | | |
| Bangor & Aroostook | 77 | 4 | | 56 | 137 | | | | | | | | | | | |
| Belt Railway of Chicago | 4 | 22 | | | 26 | | | | | | | | | | | |
| Bessemer & Lake Erie | 33 | | | | 33 | 1 | | | | 1 | | | | | | |
| Birmingham Terminal | | 46 | | | 46 | | | | | | | | | | | |
| Boston & Maine | 47 | 70 | 13 | | 130 | 1 | 1 | | | 2 | | | | | | |
| Boston Terminal | | 23 | | | 23 | | | | | | | | | | | |
| Butte, Anaconda & Pacific | 40 | | | | 40 | | | | | | | | | | | |
| Canadian National | | 2 | | | 2 | | | | | | | | | | | |
| Central of Georgia | 136 | 9 | | | 145 | 1 | | | | 1 | | | | | | 1 |
| Central R.R. of New Jersey | 65 | 146 | 2 | | 213 | | 1 | | | 1 | | | | | | |
| Chattanooga Station | | 20 | | | 20 | | | | | | | | | | | |
| Chesapeake & Ohio | 221 | 213 | 28 | | 462 | | 1 | | | 1 | | | 1 | | | 1 |
| Chicago & Eastern Illinois | 123 | 164 | 4 | | 291 | | | | | | | | | | | |
| Chicago & Illinois Midland | 22 | 5 | | | 27 | | | | | | | | | | | |
| Chicago & North Western | 966 | 418 | 260 | | 1,644 | 3 | 1 | | | 4 | | | | | | |
| Chicago & Western Indiana | 8 | 49 | | | 57 | | | | | | | | | | | |
| Chicago, Burlington & Quincy | 357 | 22 | 22 | 1 | 402 | 2 | | | | 2 | | | | | | |
| Chicago Great Western | 186 | 11 | | | 197 | | | | | | | | | | | |
| Chicago, Milwaukee, St. Paul & Pacific | 474 | 77 | 67 | | 618 | 1 | 1 | | | 2 | | | | | | |
| Chicago, Rock Island & Pacific | 533 | 118 | 9 | | 660 | | | | | | | | | | | |
| Chicago, South Shore & South Bend | 53 | 2 | | | 55 | | | | | | | | | | | |
| Chicago Union Station | | 14 | | | 14 | | | | | | | | | | | |
| Cincinnati, New Orleans & Texas Pacific | 40 | 65 | 15 | 4 | 124 | | | | | | | | 1 | | | 1 |
| Cincinnati Union Terminal | | 153 | | | 153 | | | | | | | | | | | |
| City of St. Louis Municipal Bridge | | 27 | | | 27 | | | | | | | | | | | |
| Clinchfield | 64 | | | | 64 | | | | | | | | | | | |
| Colorado & Southern | 2 | | | | 2 | | | | | | | | | | | |
| Dayton Union | | 49 | | | 49 | | | | | | | | | | | |
| Delaware & Hudson | 85 | 74 | | | 159 | | | | | | | | | | | |
| Denver & Rio Grande Western | | 27 | | | 27 | | | | | | | | | | | |
| Denver Union Terminal | 399 | 18 | | | 426 | 1 | | | | 1 | | | | | | |
| Detroit & Toledo Shore Line | | 18 | | | 18 | | | | | | | | | | | |
| Detroit, Toledo & Ironton | 4 | | | | 4 | | | | | | | | | | | |
| Duluth, Missabe & Iron Range | 3 | 9 | | | 12 | | | | | | | | | | | |
| Elgin, Joliet & Eastern | 44 | 22 | | 1 | 26 | | | | | | | | | | | |
| Eric-Lackawanna | 200 | 126 | | | 170 | | 1 | | | 1 | | | | | | 1 |
| Florida East Coast | 355 | 98 | 50 | 13 | 361 | 1 | | 2 | | 3 | | | | | | |
| Fort Dodge, Des Moines & Southern | | 7 | | | 7 | | | | | | | | | | | |
| Fort Worth & Denver | 17 | 1 | | | 18 | | | | | | | | | | | |
| Georgia | 117 | | | | 117 | | | | | | | | | | | |
| Georgia Southern & Florida | 54 | | | | 54 | | | | | | | | | | | |
| Grand Trunk Western | 128 | 45 | 3 | | 176 | | | | | | | | | | | |
| Great Northern | 386 | 40 | | | 426 | 1 | | | | 1 | | | | | | |
| Green Bay & Western | 8 | 4 | | 2 | 14 | | | | | | | | | | | |
| Gulf, Mobile & Ohio | 153 | 36 | 7 | | 196 | 1 | | | | 1 | | | | | | |
| Houston Belt & Terminal | 12 | 45 | | | 57 | | | | | | | | | | | |
| Illinois Central | 313 | 22 | 96 | | 431 | 2 | | | | 2 | | | | | | |
| Illinois Terminal | 1 | 2 | | | 3 | | | | | | | | | | | |
| Indianapolis Union | | 57 | | | 57 | | | | | | | | | | | |
| International Ry. Co. of Maine | 8 | | | | 8 | | | | | | | | | | | |
| Jacksonville Terminal | | 103 | | | 103 | | | | | | | | | | | |
| Kansas City Southern | 199 | 196 | | | 395 | | | | | | | | | | | |
| Kansas City Terminal | | 199 | | | 199 | | | | | | | | | | | |
| Kentucky & Indiana Terminal | | 25 | | | 25 | | | | | | | | | | | |
| Lake Superior & Ishpeming | | 22 | | | 22 | | | | | | | | | | | |
| Lake Superior Terminal & Transfer Ry. Co. | 4 | | | | 4 | | | | | | | | | | | |
| Lehigh & Hudson River | 13 | | | | 13 | | | | | | | | | | | |
| Lehigh Valley | 81 | 24 | | | 105 | | | | | | | | | | | |
| Long Island | 36 | 109 | 649 | | 794 | | | | | | | | | | | |
| Los Angeles Union Passenger Terminal | | 18 | | | 18 | | | | | | | | | | | |
| Louisville & Nashville | 996 | 67 | 88 | | 1,151 | 1 | 1 | | | 2 | | | | | | |
| Maine Central | 71 | 5 | | | 76 | | | | | | | | | | | |
| Memphis Union Station | | 71 | | | 71 | | | | | | | | | | | |
| Missouri-Kansas-Texas | 511 | 36 | | | 547 | | | | | | | | | | | |
| Missouri Pacific | 658 | 21 | | | 679 | 1 | | | | 1 | | | | | | |
| Monon | 145 | 6 | | | 151 | | 1 | | | 1 | | | | | | |
| Monongahela | | 7 | | | 7 | | | | | | | | | | | |
| New Jersey & New York | 9 | 2 | | | 11 | | | | | | | | | | | |
| New Orleans & Northeastern | 14 | | 3 | | 17 | | | | | | | | | | | |
| New Orleans Union Passenger Terminal | | 14 | | | 14 | | | | | | | | | | | |
| New York Central | 655 | 764 | 164 | | 1,583 | 2 | 1 | | | 3 | | | | | | |
| New York, Chicago & St. Louis | 166 | 223 | 26 | | 415 | 1 | | | | 1 | | | | | | |
| New York, New Haven & Hartford | 176 | 246 | 94 | 3 | 519 | | | | | | | | | | | |
| New York, Susquehanna & Western | 6 | 1 | | | 7 | | | | | | | | | | | |
| Norfolk & Western | 121 | 172 | | | 293 | | | | | | | | | | | |
| Northern Pacific | 1,086 | 49 | | | 1,135 | 3 | | | | 3 | | | | | | |
| Pacific Electric | | 2 | | | 2 | | | | | | | | | | | |
| Pennsylvania | 542 | 882 | 989 | 9 | 2,422 | | 3 | 3 | | 6 | | | 1 | | | 1 |
| Pennsylvania-Reading Seashore Lines | 10 | 13 | 2 | | 25 | | | | | | | | | | | |
| Peoria & Pekin Union | 5 | 12 | | 1 | 18 | | | | | | | | | | | |
| Pittsburgh & West Virginia | 22 | | | | 22 | | | | | | | | | | | |
| Port Authority Trans-Hudson Corp. | 138 | 181 | 74 | 7 | 400 | | | 1 | | 1 | | | | | | |
| Portland Terminal | 1 | 4 | | | 5 | | | | | | | | | | | |
| Reading | 51 | 82 | 17 | 7 | 157 | | | | | | | | | | | |
| Richmond, Fredericksburg & Potomac | 20 | 50 | 21 | | 91 | | | | | | | | | | | |
| River Terminal | | 78 | | | 78 | | | | | | | | | | | |
| Sacramento Northern | 1 | 2 | | | 3 | | | | | | | | | | | |
| St. Louis-San Francisco | 402 | 19 | | | 421 | 1 | | | | 1 | | | | | | |
| St. Louis Southwestern | 149 | | | | 149 | | | | | | | | | | | |
| Seaboard Air Line | 467 | 20 | | | 487 | | | | | | | | | | | |
| Soo Line | 316 | 59 | | | 375 | | | | | | | | | | | |
| Southern | 688 | 111 | 67 | 5 | 871 | | | | | | | | 1 | | | 1 |
| Southern Illinois & Missouri Bridge | 9 | | | | 9 | | | | | | | | | | | |
| Southern Pacific | 630 | 67 | 3 | | 700 | 2 | 1 | | | 3 | | 2 | | | | 2 |
| Spokane, Portland & Seattle | 77 | 2 | | | 79 | | | | | | | | | | | |
| Terminal R.R. Association of St. Louis | 9 | 291 | | | 300 | | | | | | | | | | | |
| Texas & Pacific | 107 | 3 | | | 110 | | | | | | | | | | | |
| Toledo, Peoria & Western | | 17 | | 6 | 23 | | | | | | | | | | | |
| Toledo Terminal | | 7 | | | 7 | | | | | | | | | | | |
| Union Pacific | 409 | 15 | 19 | | 443 | | | | | | | | | | | |
| Wabash | 185 | 58 | | | 243 | | | | | | | | | | | |
| Washington Terminal | | 319 | | | 319 | | | | | | | | | | | |
| Western Maryland | 70 | 32 | | | 102 | | 2 | | | 2 | | | | | | |
| Western Pacific | 182 | | | | 182 | | | | | | | | | | | |
| Western Railway of Alabama | 77 | | | | 77 | | | | | | | | | | | |
| Total | 16,614 | 8,523 | 3,281 | 138 | 28,456 | 32 | 20 | 6 | | 58 | 5 | 4 | | | | 9 |