

# ICC PROPOSES RULES & I CHANGES

Interstate Commerce Commission hearing on its proposed revision of rules, standards and instructions for installation, inspection, maintenance and repair of automatic block signal systems, interlocking, traffic control systems, automatic train stop, train control and cab signal systems, and other similar applications, methods and systems (Ex. Parte No. 171) began May 7, in Washington, D.C. before Examiner Robert R. Boyd. Beginning with this issue, RSC is publishing abstracts of testimony and the latest rule proposals. Italics in a rule indicate changes from the existing rule. Witnesses whose testimony is abstracted in RSC include: G. H. Anderson, for the Interstate Commerce Commission; F. Youngwerth and C. D. Buford, for the Association of American Railroads; and Jesse Clark, E. L. Abbott, A. E. Littlejohn, W. D. Best, W. P. Dunn, K. Clark, and W. H. Pelton, for the Railway Labor Executives' Association.

## Railway Signaling & Communications

**136.2 Grounds**—Each circuit, the functioning of which affects the safety of train operation, shall be kept free of any ground or combination of grounds which will permit a flow of current equal to or in excess of 75% of the release value of any relay or other electromagnetic device in the circuit, except circuits which include any track rail and except the common return wires of single-wire, single-break, signal control circuits using a grounded common, and alternating current power distribution circuits which are grounded in the interest of safety.

Abstract of Testimony, G. B. Anderson, Assistant Chief, Section of Railroad Safety, Bureau of Safety and Service, Interstate Commerce Commission.

**Q.** *Is Section 136.2 entitled "Grounds" . . . applicable to all signal systems?*

**A.** Yes it is.

**Q.** *What is a circuit?*

**A.** A circuit as referred to in this section is of course, an electric circuit, which is defined as the path for an electric current.

**Q.** *What is a ground?*

**A.** The term "ground", as used in these rules, is defined as a connection of an electrical conductor to the earth.

**Q.** *Did you have prepared a diagram which graphically illustrates the application of Section 136.2?*

**A.** I have.

**Q.** *Does . . . [the diagram] . . . show any circuits, the functioning of which affects safety of train operation?*

**A.** It does.

**Q.** *Please identify such circuits.*

**A.** The circuits marked "yellow control" and "green control", which are the control circuits for the yellow and green aspects, respectively, of automatic signals shown on the diagram.

**Q.** *What is a common return wire?*

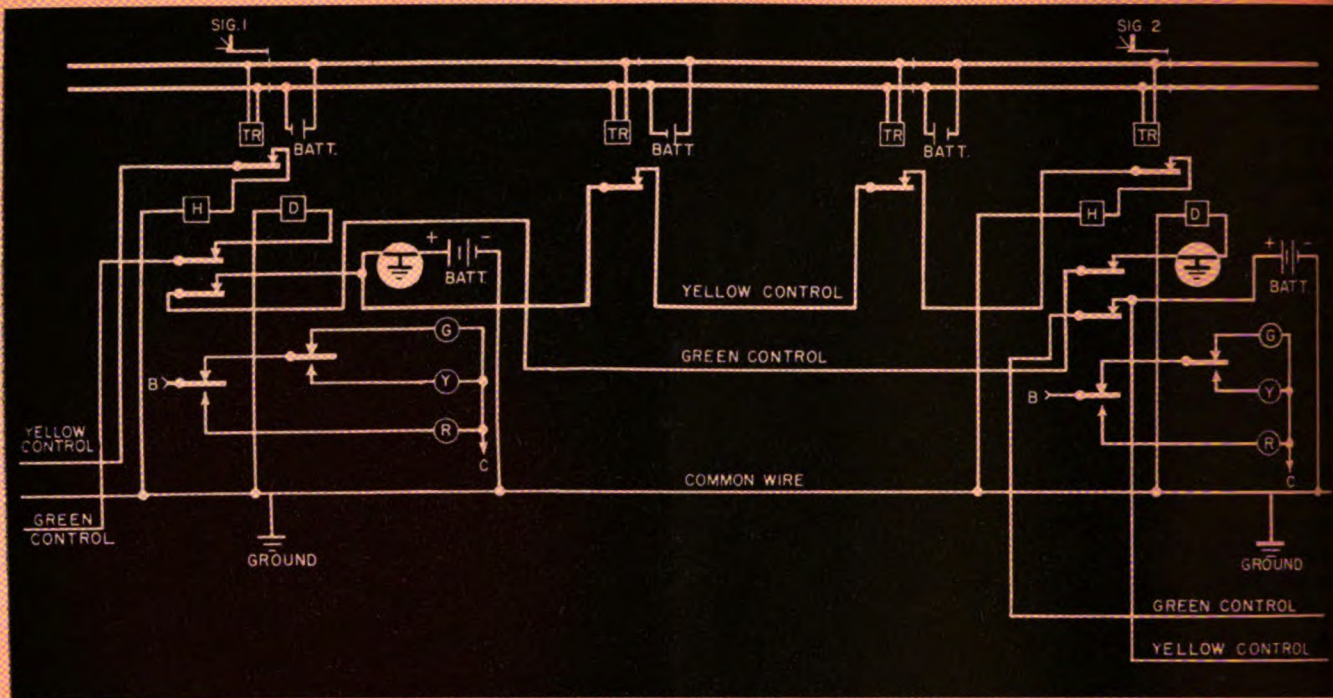
**A.** A common return wire is one that is used for the return to the negative side of the source of energy of more than one electric circuit . . . The wire marked "Common Wire" at the bottom of the diagram is the common return wire for the yellow and green control circuits for signals 1 and 2.

**Q.** *Mr. Anderson, what are the reasons for the proposed revisions of Section 136.2 as set forth in the Notice of Proposed Rule Making?*

**A.** In the administration of this rule we have been confronted with the question of circuits having wires which are intentionally grounded, such as the case of a signal system using single-wire, single-break circuits with a common return, the common being grounded at regular intervals in the interest of safety.

There was also the case of distribution circuits supplying AC energy for signal and automatic train-control systems having intentional grounds for various reasons. It was not the intent when this section was written to prohibit the use of such circuits in which wires are intentionally grounded and so the rule was revised to make it permissible intentionally to ground these circuits if it increases safety of train operation or the personal safety of employees who are required to work with such circuits.

To illustrate how safety is increased by intentionally grounding the common return wire of an automatic block-signal system using single-break, single-wire circuits with a common return, reference is made to . . . [the diagram].



... This sketch represents one track of a two-track railroad in which each track is signaled for movements in one direction only, with three-indication signals, controlled by DC track and DC line circuits. Relays designated by the letter H, are the home relays, controlling the yellow or approach aspects, while relays lettered D, are the distant relays, controlling the green or proceed aspects. Relays designated TR are track relays. It can be seen that all H and D relays, as well as the negative side of all batteries, except, of course, track circuit batteries, are connected to the common wire, which is intentionally grounded at each signal location.

Before entering into a discussion of grounded circuits it should be noted that a combination of two or more grounds must obtain in order to result in the failure of, or the improper operation of, a device controlled by the circuit which is grounded. With this in mind, let us assume that there is a ground on the positive battery wire at signal 1, as shown [circled] at the left of the sketch. Now, with the negative or common wire grounded intentionally, as shown, there is a flow of current from the battery through the two grounds, the amount of current depending upon the resistance of the grounds. Since the intentional ground is installed to be as low in resistance as possible, if the other ground is of low enough resistance, the battery will, in effect, be short-circuited, and the current through relays H and D at signal 2 will be reduced below their drop-away values, causing the front contacts of these relays to open and in turn, signal 2 to display its most restrictive aspect. Now, let us assume that the common wire is not grounded intentionally and there is a ground on the positive battery wire at signal 1, as above mentioned. Since it requires two or more grounds to result in a failure, nothing will happen until another ground occurs. Suppose then, a ground develops on the positive control wire for relay D at signal 2, as shown [circled] at the right of the sketch. If the two grounds are of sufficiently low resistance, positive energy will flow from the battery at signal 1, through the positive wire which is grounded, through the ground and thence to the grounded positive control wire for relay D at signal 2, through the relay and back to the battery at signal 1 through the common return wire. Relay D then will remain energized at all times, the grounded circuit by-passing the

breaks through the contact of relay H at signal 1 and relay H at signal 2, so that its front contacts will always be closed resulting in the display of a proceed instead of an approach aspect on signal 2, if the block of signal 1 is occupied and block of signal 2 is unoccupied. Therefore, the combination of grounds, as shown, will result in a false-proceed signal aspect when the common return wire is not grounded, while, if this wire is intentionally grounded, either or both of the grounds shown [circled] will result in a false restrictive signal only. Further, when the common return wire is intentionally grounded, any positive ground, whether or not it is low enough in resistance to cause de-energization of the signal control relays, will cause a constant current drain on the battery, which should easily be detected in the course of regular maintenance of the signal system.

In view of the foregoing, it is evident that an intentional ground on the common return wire of a single-break, single-wire circuit is in the interest of safety and therefore should be permitted by the rule, which has been revised accordingly.

With reference to that part of the revised rule which permits grounding of alternating current power distribution circuits, it is a well-known fact that all AC circuits from high voltage transmission lines to the 110-volt circuits in our homes are grounded in the interest of safety. Concerning this matter the following is quoted from Pender's Electrical Engineers' Handbook, a well-known authority on electrical engineering.

"Grounding of primary distribution circuits has two principal purposes: stabilizing circuit potentials to ground to avoid overstressing insulation, and providing a path for ground faults to aid in the operation of overcurrent devices and to secure prompt disconnecting under fault conditions. This second function is important in providing safety to the public."

"On the consumer's premises, exposed metallic parts of wiring systems and some types of utilization equipment are grounded for safety. The National Electrical Code deals in details with such grounding (see Article 87) Grounding is an important safety measure—".

In view of this, it is my opinion that the Commission's rules should conform to accepted practice and permit in-

tentional grounding of AC power distribution circuits.  
-Abstract of Testimony, Jesse Clark, President, Brotherhood of Railroad Signalmen.

Editors Note: The following proposed rule was introduced by Mr. Clark. Italics denote changes from the ICC proposal.  
**136.2 Grounds.**—Each circuit, the functioning of which affects the safety of train operation, shall be kept at all times free of any ground or combination of grounds which will permit a flow of current equal to or in excess of 50% of the release value of any relay or other electromagnetic device in the circuit, *except circuits which include any track rail and alternating current power distribution circuits which are grounded in the interest of safety. Signal circuits fed from grounded distribution circuit shall be isolated through the use of transformers or other similar devices and shall be kept free from grounds.*

Abstract of Testimony, E. L. Abbott, Editor and Manager, Signalman's Journal (Former Signalman, Missouri Pacific).

**Q.** *The proposed revision of Rule 136.2 would except circuits that are single-wire, single-break, signal control circuits using a grounded common, from the requirements of the rule. What would be the effect of such a change in the rule?*

**A.** . . . Grounded commons are not permitted under the wording of the present rule and should not be permitted in any proposed change. Signal circuits should be kept free of grounds. A grounded common would endanger the effectiveness of any circuit it served. A breakdown in any portion of the circuit not grounded would completely nullify the circuit and would drastically affect dependent circuits.

It might be argued that safety would not be involved because the circuit, if it failed due to grounds, would fail safe. To fully understand the significance of the proposed change in this rule one must consider other rules wherein the failure of a circuit would not cause a signal to display a stop indication but would cause only a proceed-at-restricted-speed indication. Circuits which affect the safety of train operations usually reflect one or more of the conditions affecting train movements, such as track occupancy, open switch, or conflicting movements. The loss of any circuit reflecting these conditions would present a potential hazard to the train, its crew, passengers, and even bystanders.

**Q.** . . . *is it desirable to provide an exception for such circuits in the rule?*

**A.** No. Signal circuits include, in most instances, extremely sensitive devices which reflect conditions affecting the movement and safety of trains. The rule should not be revised to provide for the intentional grounding of the common return of such circuits which could render the circuit useless and affect the entire system containing such circuit.

**Q.** *The present rule permits a current flow of up to 75% of the release value of any relay or other electromagnetic device in the circuit. Is it desirable to change this requirement?*

**A.** . . . the present rule should be strengthened. In signal circuits where safety is involved, no ground, other than on circuits which include any track rail, should be permitted. I feel that the permissible tolerance of 75% of the release value of any relay or other electromagnetic device in the existing rule, is excessive. If a ground exists, it is inclined to grow in severity and extent to a point where the signal circuit will fail. This is particularly true if several wires related to the same circuit are in the same cable, or are in adjacent cables in the same conduit, raceway, or ditch.

If the permissible tolerance was 50% there would be a stronger requirement to correct any ground that is found in a circuit where track rails are not involved. . . . The

difference between 75% and 50% may be small on the devices used to measure grounds, however, a 50% tolerance would require that all grounds which were discovered would receive more immediate consideration and be corrected before they adversely affected the signal system.

**Q.** *The proposed revision of Rule 136.2 also excepts alternating current power distribution circuits which are grounded in the interests of safety from the requirements of the rule. Do you have an opinion on the desirability of this change?*

**A.** With reference to that part of the proposal relating to AC power distribution circuits grounded in the interest of safety, it would appear that this condition to the rule should be made because of developments and established practice in power distribution from commercial power companies. However, I feel that if this portion is included in the rule a clause should be included to provide that signal circuits fed from the grounded distribution circuit should be isolated through the use of transformers or other similar devices and should be kept free from grounds.

**Q.** *For what reason should signal circuits fed from such grounded distribution circuits be isolated?*

**A.** Alternating current introduced into signal circuits from a distribution circuit should meet the same specifications as are now required of all signal circuits. If a grounded distribution was not isolated when introduced into the signal circuit, one side of the circuit would be grounded. . . . There is no reason for excepting circuits fed from one type of power from this important rule.

Abstract of Testimony, W. D. Best, Grand Lodge Representative, Brotherhood of Railroad Signalmen (Former Communication and Signal Maintainer, Pennsylvania).

**Q.** *In regard to the proposed revision of Rule 136.2 with a single-wire, single-break circuit using a grounded common return, are there any possibility of false signals?*

**A.** Yes. . . .

In the event that a telegraph wire should break or for some reason make physical contact with a single-break single-wire signal circuit using a grounded common wire, the danger of a false proceed indication is most eminent. . . .

**Q.** *Have you had any experiences with crossed wires?*

**A.** Yes. I have had personal experience wherein the presence of foreign current induced from a Western Union teletype wire onto a signal wire was great enough to pick up a relay falsely. . . . the common or negative side of the operating battery was unintentionally grounded in an underground switch cable that was defective. . . .

In my several years experience, I have on numerous occasions removed foreign articles from line wires such as the metal frame of a kitchen chair, a log chain, scrap wire and tree limbs which had two or more wires shorted together. On the railroad on which I have had experience the single-break, single-wire is not used for vital circuits such as signal control.

I cannot agree that it is in the interest of safety to revise an existing rule in order to cover a circuit such as the one that is described which is obviously unsafe, unsuitable and obsolete.

**136.6 Hand-operated switch equipped with switch circuit controller.**—Hand-operated switch equipped with switch circuit controller connected to the point, or with facing-point lock and circuit controller, shall be so maintained that when point is open  $\frac{1}{4}$ " or more on facing-point switch and  $\frac{3}{8}$ " or more on trailing-point switch, track or control circuits will be opened or shunted or both, and if equipped with facing-point lock with circuit controller, switch cannot be locked. On such hand-operated switch, switch circuit controllers, facing-point locks, switch-and-lock movements, and their connections shall be securely fastened

in place, and contacts maintained with an opening of not less than 1/16" when open.

Abstract of Testimony, G. B. Anderson, Assistant Chief, Section of Railroad Safety, Bureau of Safety and Service, Interstate Commerce Commission.

**Q.** . . . Are the requirements of Section 136.6 applicable to all signal systems?

**A.** Yes they are.

**Q.** . . . What is the reason for the proposed revision of Section 136.6?

**A.** In our experience with the administration of the present rule, we have found that the last sentence of the rule has been interpreted by some people as applying to interlocking switches, as well as to hand-operated switches, although the title of the section is "Hand-operated switch equipped with switch circuit controller." The section has been revised therefore so that it can be construed as applying to hand-operated switches only. This has been accomplished merely by inserting the words "on such hand-operated switch" before the words "switch circuit controllers" in the last sentence of the rule.

**136.11 Adjustment, repair, or replacement of apparatus**—Any piece of apparatus or any part thereof which fails to perform its intended function shall be promptly adjusted, repaired, or replaced. [Proposed revision is as follows:]

**136.11 Adjustment, repair or replacement of component**—When any component of a system or interlocking, except track rails, the proper functioning of which is essential to the safety of train operation, fails to perform its intended function, it shall be adjusted, repaired or replaced without undue delay.

Abstract of Testimony, G. B. Anderson, Assistant Chief, Section of Railroad Safety, Bureau of Safety and Service, Interstate Commerce Commission.

**Q.** . . . Do the requirements of this section [136.11] apply to all signal systems?

**A.** Yes they do.

**Q.** What are the reasons for the proposed revisions of Section 136.11, as set forth in the Notice of Proposed Rule Making?

**A.** This section originally was intended to insure that if a signal department employee in the course of his duties, or one of the Commission's inspector, while making a routine inspection, discovered a piece of signal apparatus, such as a relay, a switch circuit controller, an electric lock, a switch-and-lock-movement, etc. that was defective to such an extent that it failed to perform its intended function, it would be adjusted, repaired or replaced as soon as practicable. However, this section has been the subject of more varied interpretations than any other, and accordingly administration of the rule has become increasingly difficult. The rule has been interpreted rather broadly by some to mean that signal maintenance forces must be called immediately to investigate and correct all signal interruptions or signal failures. Because a signal displays a red or stop aspect with no train in the block it is no indication that it is not performing its intended function, and accordingly the rule obviously cannot be construed as requiring that a signal maintainer be called in every instance where a signal may display a stop aspect for no apparent reason. There are many conditions under which a signal may display a stop aspect, other than block occupancy. If a switch is left open, or an independently operated derail with switch circuit controller is left in non-derailing position on a side track, the signal will quite properly display a stop aspect and no matter how long this condition is permitted to exist, there is no violation of Section 136.11.

Much difficulty in administering the present rule stems from interpretation of the word "promptly". Some have

insisted that "promptly" be interpreted to mean "at once or without delay, and it is not always possible, even with the best of intentions, to repair or replace a piece of apparatus without any delay, and in this respect the present rule cannot be complied with literally. However, it may be possible to repair or replace it without excessive delay and for this reason the phrase "undue delay" has been substituted for the word "promptly" in the revised rule.

We have also experienced difficulty with interpretation of the word "apparatus". Apparatus is defined as a complete device or machine, and when the present rule was adopted such signal equipment as a relay, switch circuit controller, signal mechanism and switch-and-lock movement was considered to fall within the definition of the word apparatus. But we have been confronted with an interpretation of the word apparatus to include such things as bond wire and track rails. Now, I do not consider a bond wire or rail to be a piece of apparatus but they are components of a signal system, and accordingly the word "component" has been substituted for the phrase "piece of apparatus or any part thereof" in the revised rule. I believe this change actually broadens the scope of the rule, because component is more comprehensive than apparatus, although, as above mentioned, a track rail is a component of a track circuit, and hence a signal system. Track rails are excluded in the revised rule for the reason that they are not primarily signal equipment, and their maintenance and repair are not the responsibility of signal maintenance forces. Further, to comply with other requirements of the Commission's rule standards and instructions, a signal must display its most restrictive aspect when a rail is broken in the block which it governs train movements, and when a signal displays a stop aspect because of a broken rail, it is performing its intended function, and this is not a violation of Section 136.11. The phrase "the proper functioning of which is essential to the safety of train operation" has been inserted after the words "component" in the revised rule, because there are many situations where the safe movement of train is not adversely affected by failure of a component, and accordingly delay in replacement or repair is not so imperative as it is in the case of a failure which could result in the false proceed operation of some part of a signal system or interlocking.

Since there has been some objection to the phraseology of the revised rule reading "defective to such an extent that it fails to perform its intended function," it is now proposed to revert to the wording of the present rule in this respect, and accordingly after the word "operation" the words "defective to such an extent that it," will be deleted. The rule as further revised will then read as follows:

**136.11 Adjustment, repair or replacement of component.** When any component of a system or interlocking, except track rails, the proper functioning of which is essential to safety of train operation, fails to perform its intended function, it shall be adjusted, repaired or replaced without undue delay.

Abstract of Testimony, Jesse Clark, President, Brotherhood of Railroad Signalmen.

**Q.** In regard to . . . Rules 136.11; is the change proposed by the ICC desirable in your opinion?

**A.** It is not desirable.

**Q.** For what reason?

**A.** The reason I don't think it is desirable because we feel that any apparatus that fails or is not functioning properly should be repaired immediately, and not at some future date or some future time.

As we understand the Commission's proposal, they can correct the failure or condition when convenient, and not

immediately, as proposed by the present rule. The present rule reads, "any piece of apparatus or any part thereof which fails to perform its intended function shall be promptly adjusted, repaired or replaced." I think the word "promptly" means exactly what it says, not at some future time.

Abstract of Testimony, E. L. Abbott, Editor and Manager, Signalman's Journal.

**Q.** *The proposed revision of rule 136.11 excepts track rails from the requirements of the rule. Are track rails a part of a signal system or interlocking?*

**A.** Track rails . . . form a physical portion of the track circuit. . . . A track circuit consists essentially of a section of track, a source of power for the current, and a relay. Each of these items, including track rails, are principal components of a track circuit and a signal system or interlocking. In addition, . . . in certain types of traffic control systems, the track rails are used exclusively for the transmission of all circuits of the system since no line wires are used.

**Q.** *In your opinion is it desirable to exclude track rails from the scope of this rule?*

**A.** No. . . . Track rails are essential parts of the signal system and interlocking; they are essential to the safety of train operation, and if they fail to perform their intended function the results are just as detrimental to the system as the failure of any other component. If any part of a signal system fails, including track rails, it should be repaired or replaced promptly.

**Q.** *The proposed revision of rule 136.11 requires repair or replacement only of a component "the proper functioning of which is essential to the safety of train operation." Is it desirable to insert this qualification into the rule?*

**A.** No, it is not. . . .

Any definition as to what may be essential to safety and what may not be is not clearly defined in the devised rule and allows personal opinion or interpretation to become a deciding factor in the application of the rule. Dispatchers, operators and others not skilled in railway signaling would regularly be called upon to determine if a signal component was essential to safety. The proposed rule charges these individuals with the responsibility of making decisions in a field in which they are not qualified.

**Q.** *Would safety of operations be affected if it is determined that a defective signal need not be repaired since no train movements are scheduled to pass such defective signal?*

**A.** A dispatcher, for example, might decide that due to a defective signal he would not use a particular siding in traffic control territory only to find that at a later time that circumstances beyond his control had changed to make the use of this siding necessary

**Q.** *What are some of the circumstances which would alter the dispatcher's decision?*

**A.** If a train meet was planned at one siding many things such as dragging equipment, hotboxes, broken draw bars, broken air lines and other defective equipment could, and in many instances do, delay trains enough to require a dispatcher to change meeting points from one siding to another.

**Q.** *The proposed revision of Rule 136.11 requires that a component which fails to perform its intended function shall be adjusted, repaired or replaced "without undue delay." . . . Is it desirable to change the command of "promptly" [from the present rule] to "without undue delay."?*

**A.** In my opinion no good reason exists why "promptly" should be replaced by "without undue delay." "Promptly" would mean "without delay," however "without undue delay" would mean "without excessive delay." The failure of a component should be corrected at once. The word "undue" introduces the element of personal opinion as to

just how much time is involved in an "undue delay." The present rule should be retained since it is specific in its requirements and requires no interpretation.

The defect in the proposed rule is clear. The rule indicates that there are some components the proper functioning of which are essential to the safety of train operation. However, the rule then permits an unspecified amount of delay in the repair or replacement of such components which fail to perform their intended function. It is my opinion that when the safety of train operations is affected by a defective component, every effort should be made, in the interests of safety, to immediately and without delay correct the unsafe condition.

Abstract of Testimony, Ansel E. Littlejohn, Leading Signalman, Elgin, Joliet and Eastern.

**Q.** *Does the insertion of "without undue delay" for the term "promptly" change the meaning of Rule 136.11?*

**A.** Yes. The phrase "without undue delay" is subject to different interpretations. The word "undue" can mean various things to different people, the time element involved is not certain. It assumes that some delay is permitted, and some holding back of repair.

**Q.** *Would such a delay affect the operation of a signal system?*

**A.** Yes. Repairs should be made promptly. When there is a failure or defect in the signal system that is not promptly corrected, the usefulness of the signal system and the line of railroad has been reduced. If there is a failure or defect in the signal system, it will not accurately reflect the condition of the track. . . . In many cases defects are detected which show that it is not safe to operate trains in the territory. In my experience I frequently have found switch points open in excess of the permissible  $\frac{1}{4}$ " for various reasons detected by the signal system. If this condition is not corrected it is not safe for the normal operation of trains. With the switch point open in excess of  $\frac{1}{4}$ " it is not normally possible for the engineman to detect it from his position in the cab of the locomotive. . . .

**Q.** *The proposed revision of Rule 136.11 inserts a new phrase—"the proper functioning of which is essential to the safety of train operations," into the rule. Would this change the meaning of the rule or interlocking whose function is not essential to the safety of train operations? Would this change have any effect on safe operation of systems and interlockings?*

**A.** Yes. This change leaves the decision of whether or not signal components will be repaired to unqualified persons. The present rule compels them to be repaired promptly. The proposed rule allows the repair to be deferred. I know of no components which are not essential to the safety of train operations.

**Q.** *Do all broken rails affect the signal system?*

**A.** No. I have had experiences where broken rails do not affect the signal system. They are generally found by signalmen and trackmen, while making regular inspections.

**Q.** *What is done when such breaks are found?*

**A.** When such broken rail is found, we notify proper authority and protect the area by stopping trains as a matter of normal practice, although there is no specific requirement for this by the carrier. Normally, we remain at the location until the break is repaired, to provide protection and then bond the repair work.

**Q.** *Is broken rail protection a part of a block signal system?*

**A.** The condition of the rail is one of the most important items of information a signal system shows, that it is safe for a train to operate over the track. Many breaks, not affecting the signal system, are dangerous, for example—split web, broken base, split head. If the signal system does not show this hazard, safety requires that trains will receive advance warning of the defect once discovered.

Abstract of Testimony, W. D. Best, Grand Lodge Representative, Brotherhood of Railroad Signalmen.

**Q.** Does the addition of the phrase "essential to the safety of train operation" change present Rule 136.11?

**A.** Yes. This could leave the decision as to whether or not signal equipment should be repaired up to persons who have no knowledge of their functions. It may be that a dispatcher can foresee whether or not he will need a particular signal in which a lamp is burned out; however, this rule concerns all signal equipment. . . .

**Q.** The revised rule excepts track rails; are such rails a part of the signal circuits?

**A.** Yes. Track rails are not only used as conductors for track circuits but also for other types of signal circuits. Energy from the transmitter is conveyed to the receiver by means of track rails in an AFO installation. . . . A large part of the ABS that I maintained used DC coded track circuits. There are no conventional line control circuits used in this type of signaling and the track rails are the only conductor used for signal circuits. Although I have never installed or maintained them, there are track circuits which are wholly dependent upon the track rails. By that I mean the rails not only provide the conductor for the energy to the track relay, but also the AC energy to the track rectifier. In this type circuit, no battery is used and the low voltage AC is transmitted through the rails from a signal location to a cut section where the rectifier is mounted between the rails on a cross tie. The rectifier converts the energy to DC that is applied to the rails and picks up a track relay at the signal location from which the AC energy originated. Here, too, line wires are not used.

**Q.** Is it desirable to except track rails from this rule?

**A.** I think it is foolhardy to except track rails from this rule, because our signal systems are even more dependent upon the rail than they were when these rules were revised in 1950, and the rule as written does not except track rails. . . . Inasmuch as insulated joints are components of track rails, they too would be excepted under this rule and would give the ICC no control over them and their condition. It is a well established fact that defective insulated rail joints can cause false proceed indications on signals. In respect to defective insulated joints, the defect is not always visible and tests are required to discover the defect.

In addition, at certain locations the presence of a broken rail may affect the operation of other devices. At an electrically locked hand-operated switch, which is automatically controlled, a broken rail in the unlock section of the track will permit the electric lock to be unlocked. It is recognized that broken rails do not always affect the track circuit and just as often they only open the track circuit intermittently. In such a situation a train could have passed a clear signal and subsequent to its passing the signal, the broken rail could cause the switch to be unlocked with the train on the approach and the switch thrown in front of the train.

At highway crossing protection installations, a broken rail can adversely affect the protection afforded. This is commonly referred to as a lock out and will affect the flashers the same as a reverse move over the crossing after a forward movement.

Abstract of Testimony, Walter P. Dunn, Locomotive Engineer, Boston and Maine.

**Q.** Concerning Rule 136.11, is the proposed revision desirable?

**A.** No, it is not. The proposed revision rewrites the present rule. This important rule applies to all signal systems and interlockings, and it is vital that they be continuously maintained in perfect operating condition. The present requirement for prompt repair should not be relaxed by employing the words "without undue delay." The words "without

undue delay" connote that some delay is permissible. However, no delay should be permitted since this would decrease safety of train operations.

**Q.** Rule 136.11 as proposed excepts track rails from the requirements of the rule. What is your opinion concerning the proposed revision of this rule?

**A.** Track rails are the heart of the signaling circuit and such a vital component should not be excepted from the requirements of Rule 136.11. When there is a track defect discovered that does not affect the signal system, advance warning and protection of such hazardous conditions should be given to trains through manual operation of the signal. However, the rules should provide for the maximum possible broken rail protection by strongly promoting this all-important feature of a track circuit. . . .

Abstract of Testimony, Kenneth Clark, Locomotive Engineer, Chicago, Milwaukee, St. Paul and Pacific.

**Q.** Do you have a comment regarding the proposed amendment of Rule 136.11?

**A.** Yes, I do. . . . It seems to me that this exception of track rails is a serious mistake which weakens the rule. Of all the components of a railway system necessary for safe operation, certainly the track rails themselves are one of the most important. Proper track rails are important not only for the proper operation of a signal system but are essential to the movement of the train itself.

Moreover, the rails are an integral part of the electrical circuits which control the operation of the block signal. . . . Another portion of the proposed rule upon which I wish to comment is the change in the time in which repairs must be made. Under this section as it now stands, the repair, adjustment or replacement must be made "promptly." Under the proposed rule it need be made only "without undue delay." This will definitely permit the carriers to delay maintenance. . . .

In summary, then, it is my belief that the exception for track rails should be deleted and that the language of the present rule requiring repairs be made "promptly" should be maintained.

Abstract of Testimony, Warren H. Pelton, Locomotive Engineer, Missouri Pacific.

**Q.** Do you have an opinion on the proposed revision of Section 136.11?

**A.** Yes, I do. One of the principal changes made in this section is to provide that repairs to components shall be made without undue delay. . . . Further, the proposed amendment requires repairs to be made only to components which are "essential to the safety of train operations." . . . Both of the changes permit a large area of individual discretion in determining what is "without undue delay", and in determining what components are "essential". Such latitude for individual judgments should not be allowed with respect to the repair of signal systems. This definitely represents a relaxation and a weakening of the section. It might have this very bad consequence: the top management of a railroad may be fully determined to make conditions just as safe as humanly possible. They may attempt to convey this spirit down to the lower echelons of management, but one thing that is important to bear in mind is this: At the same time that the top management is trying to convey to the lower echelons of management the importance of safety, that management is also conveying to the lower ranks of management the importance of operating economically and the importance of making a profit. The result may be that there will be cases where junior officers, instead of trying to comply faithfully with top management's desire to achieve maximum safety, may become cost conscious, and in order to obtain a better cost record in their own particular departments, may be tempted

to reduce standards of maintenance. So long as the rule requires that signal equipment be repaired and replaced "promptly", then it seems to me that junior management will be more apt to comply than they are apt to comply with a command which says simply that they are to act "without undue delay". Under the present rule there is a positive command to act.

**136.51 Track circuit requirements.**—Track relay shall be in deenergized position whenever any of the following conditions exists, and the track circuit of an automatic train-stop, train-control, or cab-signal system shall be deenergized in the rear of the point where any of the following conditions exists:

(a) When a rail is broken or a rail or switch-frog is removed except when a rail is broken or removed in the shunt fouling circuit of a turnout or crossover, provided, however, that shunt fouling circuit may not be used in a turnout through which permissible speed is greater than 45 mph. It shall not be a violation of this requirement if a track is energized: (1) When a break occurs between the end of rail and track circuit connector; within the limits of rail-joint bond, appliance or other protective device, which provides a by-path for the electric current, or (2) as result of leakage current or foreign in the rear of a point where a break occurs or a rail is removed.

(b) When a train, locomotive, or car occupies any part of a track circuit, including fouling section of turnout except turnouts of hand-operated main track crossover. It shall not be a violation of this requirement where the presence of sand, rust, dirt, grease, or other foreign matter on the rail prevents effective shunting.

(c) Where switch shunting circuit is used:

1. Switch point is not closed in normal position.
2. A switch is not locked where facing-point lock with circuit controller is used.
3. An independently operated fouling-point derail equipped with switch circuit controller is not in derauling position.

Abstract of Testimony, G. B. Anderson, Assistant Chief, Section of Railroad Safety, Bureau of Safety and Service, Interstate Commerce Commission.

**Q.** Mr. Anderson, am I correct in concluding that Section 136.51 applies to all track circuits used in connection with any signal system?

**A.** You are.  
**Q.** Mr. Anderson, what are the reasons for the proposed revisions of Section 136.51, as set forth in the Notice of Proposed Rule Making?

**A.** Ever since this rule has been in effect we have been confronted with the fact that literal compliance with all of the requirements of this rule is practically impossible. The rule fails to take into consideration that there is a tie-plate under each rail on every tie and if a rail breaks over a tie-plate a by-path for the track current is provided by the tie-plate, and if the contact between the rail and the tie-plate is good enough the track relay will remain energized in violation of the rule. Evidence has been introduced in a hearing before the Commission to show that in the case of a 39-ft rail with 37 ties to the rail-length and using joint bars 2 ft 4" long, broken rail protection is provided for only 38% of the rail. Guard rails at switches and frogs being bolted to the main-track rails also provide by-paths for the track current around a break in the main-track rail, further reducing the percentage of broken rail protection. Rails bolted to the main-track rails often are used to provide flangeways at highway grade crossings, and in such cases these rails also provide by-paths around a break in the main track rail. It is proposed the section be revised, therefore, to provide that it shall not be a violation of

the rule if a break should occur in any of these numerous places where the track current may be by-passed by some appliance or protective device that is just as essential for the safe and efficient operation of the railroad as the track circuit itself. This proposed revision consists of substitution of the following for the second sentence of paragraph (a): "It shall not be a violation of this requirement if a track circuit is energized: (1) When a break occurs between the end of rail and track circuit connector; within the limits of rail-joint bond, appliance or other protective device which provides a by-path for the electric current."

Abstract of Testimony, Jesse Clark, President, Brotherhood of Railroad Signalman.

**Q.** In regard to Rule 136.51, what is your opinion?  
**A.** I think any time—it pertains to Track Circuit Requirements—any time there is a rail removed, broken rail, switch or frog removed, switch point opened an excessive amount, they ought to be repaired immediately, and there ought to be somebody available to see that the signals are placed in the restricted position to make certain there are no movements made over that section of track while the rail is out, or any other defective condition exists.

**Q.** Regarding that point, that if there is a track defect, some type of signal should be set to a stop position, is that an unusual requirement in the industry?

**A.** It is not. On the contrary, a great many carriers require immediate action to be taken to protect trains from these conditions by providing that a signalman shall disconnect or shunt a circuit or take whatever action is necessary to cause the signals to show their most restrictive aspect. In other words, to see that signals take their most protective position while the track is unsafe.

Editors Note: The following proposed rule was introduced by Mr. Clark. Italics denote changes from the ICC proposal.  
**136.51 Track Circuit Requirements.**—Track relay shall be in deenergized position whenever any of the following conditions exist, and the track circuit of an automatic train-stop, train-control, or cab-signal system shall be deenergized in the rear of the point where any of the following conditions exist:

(a) When a rail is broken or a rail or switch-frog is removed except when a rail is broken or removed in the shunt fouling circuit of a turnout or crossover. A shunt fouling circuit may not be used in a turnout through which permissible speed is greater than 25 mph.

It shall not be a violation of this requirement if a track circuit is energized: (1) when a break occurs between the end of the rail and track circuit connector or within the limits of the rail joint bond, *provided that all bonds and track circuit connectors applied to the web of the rail shall be applied within 3" of the end of the angle bar,* or (2) as a result of leakage current or foreign current in the rear of a point where a break occurs or a rail is removed.

*When broken rail, wide gage, insecure track, obstruction or other condition which renders the track unsafe for passage of trains is discovered, signals or other controlling devices shall be caused to display their most restrictive indication to provide signal protection. The signals or other controlling devices shall not be restored to normal operation until it is known that track is safe.*

(b) When a train, locomotive or car occupies any part of a track circuit, including fouling section of turnout except turnouts of hand-operated main track crossover.

*When the presence of sand, rust, dirt, grease, or other foreign matter on the rail prevents effective shunting of the track circuit, signals shall be caused to display their most restrictive indication to provide protection. The signals shall not be restored to normal operation until it is known effective shunting of track circuit is provided.*

(c) Where switch shunting circuit is used:

1. Switch point is not closed in normal position.
2. A switch is not locked where facing-point lock with circuit controller is used.
3. An independently operated fouling-point derail equipped with switch circuit controller is not in derailing position.

Abstract of Testimony, E. L. Abbott, Editor, and Manager, Signalman's Journal.

**Q.** *The proposed revision of Rule 136.51 provides in paragraph (a) an exception for rail breaks between the end of rail and track connector or within the limits of rail-joint bond, appliance or other protective device, which provides a bypath for the electric current. In regard to rail-joint bonds and track circuit connectors, is it desirable to provide an exception for rail breaks in the area of these appliances in the rule?*

**A.** It is generally recognized that a break in a rail in the area within the limits of these appliances will not always affect the track circuit. However, this area should be as small as possible to promote maximum broken rail protection. The use of these devices should not be recognized in the rule without any requirement specifying how they should be installed.

**Q.** *What requirement is needed for the installation of these devices?*

**A.** Some of these appliances are applied to the ball of the rail at the rail joint and there would appear to be no problem as to these appliances. However, some types of these appliances are applied to the web of the rail and are greater in length, leaving larger areas without broken rail protection. Neither the present rule or the proposed rule contains a requirement for the installation of such devices. They can be installed at any point from the angle bar. Therefore, a requirement is necessary to insure that these devices are not installed excessive distances from the angle bar. In my opinion it should be required that these appliances be installed within 3" of the angle bar.

**Q.** *In regard to "appliances or other protective devices," is it desirable to provide for these items in the rule?*

**A.** There are certain rail devices installed in such a manner that a break in a rail in areas within the limits of such devices will not always affect the track circuits. However, I do not feel that the unrestricted use of appliances or other protective devices should be authorized by this rule which is designed to insure safety of railroad operation. Such devices as tie plates, rail joint bars, guard rails at frogs, and rail braces at switches are normal devices which can be recognized by the rule. But, the proposed rule grants wholesale permission for the use of anything which can be called an appliance or protective device without taking into consideration the ultimate loss of broken rail protection.

**Q.** *Have you ever found a broken rail in a track circuit which did not continuously affect the signal indication controlling movement over that track?*

**A.** In almost every instance that I can recall where the rail was not a multiple break the track circuit would only be affected for short periods of time. In the cases where automatic signals were used to govern train movements over this track they would display a stop indication only at infrequent intervals and would not indicate the presence of an unsafe condition continuously.

**Q.** *How do you account for this?*

**A.** . . . When there is only a single break, any metallic substance such as chips or filings can bridge a small gap in the rail and complete the track circuit. In other instances the break may be over a tie plate or next to a rail brace or guard rail which will conduct the track circuit current under some conditions. However, such conditions seldom exist where substantial portions are broken out of a rail.

**Q.** *Do you feel that either the present or the proposed rule provides a sufficient minimum requirement for the safety provided by track circuits?*

**A.** I do not. Both rules appear to provide exceptions from the basic requirements of the rule. Many of these exceptions are recognized as unavoidable. However, no provisions have been made to guarantee satisfactory alternate manual protection when the system does not reflect an unsafe condition.

As an example, I can recall several instances where pieces were broken from the ball and web of the rail leaving the base of the rail and a part of the web intact. This served as a conductor for the track circuit. This would present an extremely unsafe condition and would not affect or interrupt a track circuit and would not be reflected in the signal indication displayed. In these cases, the track's condition was detected by employees and corrected. However, this carrier's rules required that signals should be secured to display their most restrictive aspect. This action was taken and signal protection was provided to indicate that the track was unsafe. This protection continued as long as the track remained unsafe.

It is my opinion that safety provisions should be written into 136.51 requiring action comparable to that taken by this carrier to protect, by use of the signal systems, against unsafe conditions which may affect the movement of a train. . . .

**Q.** *Do you have an opinion concerning the inclusion in this rule of a provision for foreign matter on the rail?*

**A.** . . . This rule should not grant a blanket exclusion for loss of track shunting caused by the presence of foreign matter. The present and proposed rules only provide an excuse for failure of the track circuit. There should be a provision in the rule requiring that when such conditions exist, to the extent that safety to train operation is affected, signals governing movement into and through the affected area should be made to display their most restrictive aspect until the condition has been corrected.

Abstract of Testimony, E. L. Abbott, Editor, and Manager, Signalman's Journal.

**Q.** *Effective shunting is involved in rule 136.51; are there any special rules on the Pennsylvania in regard to loss of shunting.*

**A.** There are specific rules on Pennsylvania that provide that when sand, rust, etc. prevent shunting, the operator must be notified and levers marked. The rule provides protection to trains and crews.

**Q.** *Can effective shunting be promoted?*

**A.** Yes. There are possible means of correcting loss of effective shunting, improved track circuits can be installed to increase shunting sensitivity and in addition there are means of increasing the resistance of the track rail to rust, dirt, etc. There should be some requirement to promote the greatest possible effective shunting.

**Q.** *Do all broken rails affect the signal system?*

**A.** No. I have had experience where broken rails did not affect the signal system. They are found by track patrolmen and maintainers. The Pennsylvania rule requires that signals governing moves over the broken rail must be secured in their most restrictive positions and trains protected. And proper authorities must be notified. The rule protects operations by causing signals to display proper aspects and correctly indicate the condition of the track. . . .

**Q.** *Are broken rails hazardous to train operations?*

**A.** Yes. A broken rail, of any type, presents a hazard to train operations; the signal should warn the crews of the danger to be guarded against, so that the train can be stopped and speed reduced to a safer level for passage of the train over the break. The Pennsylvania rule insures that trains will receive proper warning of broken rails not



affecting the signal system. Some similar requirement should be imposed by the ICC for all carriers.

**Q.** *Is there any requirement that track circuit connectors and rail joint bonds be installed within a certain distance from the angle bar?*

**A.** No. The Pennsylvania has no such special rule regarding installation of track circuit connectors and rail joint bonds. The installation location is left up to the discretion of the maintainer or construction gang installing the device.

I have discovered connectors up to 10" from the end of an insulated joint, and 10" apart on connections to fouling circuits. I have seen 48" rail joint bond wire applied where a shorter wire should have been used. In these cases excessive amounts of track were left unsignaled. A provision in the rule establishing a standard would provide the maximum broken rail protection. . . .

**136.201 Track-circuit control of signals.**—Signals shall be controlled automatically by track circuits extending through the entire block. [Proposed revision is as follows:]

**136.201 Track-circuit control of signals.**—*The control circuits for home signal aspects with indications more favorable than "proceed at restricted speed" shall be controlled automatically by track circuits extending through the entire block.*

Abstract of Testimony, G. B. Anderson, Assistant Chief, Section of Railroad Safety, Bureau of Safety and Service, Interstate Commerce Commission.

**Q.** . . . *Does this section [136.201] apply only to automatic block-signal systems?*

**A.** Yes it does.

**Q.** *Mr. Anderson, what are the reasons for the proposed revisions of Section 136.201? . . .*

**A.** It has been proposed this section be revised merely in the interest of clarification. The present rule can be interpreted, and it has been so interpreted by some, to require that all aspects of a signal shall be controlled by track circuits. Whereas, it was never intended that proceed-at-restricted speed aspects shall be so controlled. The very indication of a restricting signal aspect, that is, "proceed at restricted speed" precludes the aspect from being controlled by a track circuit. Restricted speed means proceed prepared to stop short of train, obstruction, or switch not properly lined and to look out for broken rail, at not exceeding 20 miles per hour. Section 136.51 requires that track relay shall be deenergized when the track circuit is occupied by a train or other obstruction, when switch is not properly lined, and when a rail is broken, and accordingly a proceed-at-restricted-speed aspect cannot be controlled by a track relay in the energized position, but on the contrary, if any track relay control is included in the circuit, it must necessarily be through the back contact of the relay, closed when the relay is deenergized. In this connection it should be understood that when we speak of track circuit control of signal aspects we mean that the control circuit is broken through front contacts of track relays and not back contacts through which the circuits for proceed-at-restricted-speed aspects are carried. The rule as proposed merely clarifies the present requirements, which have always been interpreted by the Commission's Bureau of Safety and Service to mean that proceed-at-restricted-speed aspects need not be controlled by track circuits.

**Q.** *Have any further changes been suggested in Section 136.201, which should be considered in this proceeding?*

**A.** Yes, it has been suggested in a verified statement and in our informal discussion of the proposed revisions that the word "home" be inserted before the word "signal" in the rule, so that the rule as now proposed would read as follows:

**136.201 Track-circuit control of signals.** The control circuits for home signal aspects with indications more favorable than "proceed at restricted speed" shall be controlled automatically by track circuits extending through the entire block.

It is considered that this revision would improve the rule by specifying the kind of signal to which it relates.

Abstract of Testimony, E. L. Abbott, Editor, and Manager, Signalman's Journal.

**Q.** *What is your opinion regarding the proposed change for this rule [136.201] that would not require track circuits to control proceed-at-restricted-speed aspects and those less favorable?*

**A.** I think that this revision of the rule should not be adopted. I cannot agree that this is merely a clarification of the present rule, since I do not agree that stop aspects of a signal are not now controlled by track circuits. . . . All aspects, including stop, are controlled by the track circuit. It is not correct to say that signal indications are not controlled by the track circuit because the control circuit is broken through back contacts of track relay. The error of such statement is realized when it is noted that the back contacts of relays are often used to operate approach lighting of signals. In this example, does the track circuit control the approach lighting? It does, in the same manner that the track circuit controls a stop aspect.

Therefore, it is my opinion that the proposed rule should not be adopted. The plain wording of the proposed rule would permit signal installations where proceed-at-restricted-speed aspects and those less favorable would not be governed by the track circuit. The rule would, however, permit any other type of control of these signal aspects.

**Q.** *The proposed revision of this rule also restricts the application of the rule to only home signals; what is your opinion as to the desirability of this proposal?*

**A.** In my opinion this is a most serious change that is proposed. It would remove the requirement that all signals other than home signals be controlled by track circuits. Thus, only home signals would indicate track occupancy, open switch, or broken rail. The only automatic control circuit for signals I can think of, which does not use track circuits, would be the circuits that cause a signal to indicate the condition of the home signal. In other words, the only information conveyed by such signals would be a warning of the home signal aspect to provide braking distance for a stop at the home signal.

To exclude all signals, except home signals, in automatic block-signal territories from the requirement that they be track circuit controlled would eliminate their power to evaluate track conditions.

A signal, governing train movements, displaying a signal aspect which does not reflect conditions affecting that movement over a track is, to me, displaying a false indication and where signals are not track circuit controlled they are doing just that.

Abstract of Testimony, Ansel E. Littlejohn, Leading Signalman, Elgin, Joliet and Eastern.

**Q.** *What change has been proposed for this rule [136.201]?*

**A.** The proposal excepts signal aspects of proceed at restricted speed and those less favorable from the rule.

**Q.** *What would be the effect of this proposed change?*

**A.** First, I cannot agree with the argument that the stop aspect or the most restrictive aspect of a signal are not now controlled by track circuits. The signal control circuits of the system control these aspects now. The clear wording of the proposed rule would remove the control of stop signals from track circuit control. It would permit a carrier to control these stop aspects by methods that are left up to their own discretion. I know of no other way other than

by track circuit control to safely control these aspects of the signal system. The track circuit is the only method recognized as totally safe whereby a train may retain continuous and direct control of a signal while occupying the part of the track governed by the signal.

It must be remembered that the relay which controls the stop aspect of a signal also controls the approach aspects of signals to the rear of the stop signal in many systems. If the stop aspect need not be controlled by track circuits, this would also have an effect on the control of other signals in the system. It is not entirely true to say that control circuits for all signals more favorable than proceed at restricted speed are broken through front contacts of track relays. Control circuits for signals displaying an approach aspect can be started over the back contacts of a track relay. A polar circuit is an example of such a control circuit.

**Q.** *The proposed revision of this rule would apply only to home signals. What is your opinion as to the omission of other than home signals from the rule?*

**A.** It is excluding the majority of signals. Except in cases such as cab signaling, home signals are in the minority. . . .

**Q.** *If approach and distant signals are not controlled by track circuits, what effect would this have on safe operation in the territory?*

**A.** I don't believe trains can operate with any degree of safety on signal indication that isn't controlled by track circuits. I know of no other system or device, other than detector bars, that can provide the connection between the railroad and the signal system. The track circuit is such a link and to remove this link is to seriously reduce the effectiveness of the signal system.

Abstract of Testimony, W. D. Best, Grand Lodge Representative, Brotherhood of Railroad Signalmen (Former Communication and Signal Maintainer, Pennsylvania).

**Q.** *Rule 136.201 now requires that signals be controlled automatically by track circuits. The proposed revision would except signal aspects of proceed at restricted speed and those less favorable from the rule. Are these aspects now controlled by track circuits?*

**A.** I cannot agree that such aspects are not now controlled by track circuits. The condition of the track itself may or the presence of a train in the circuit will cause the track relay to be in a deenergized position, and this is the track circuit's most important function—to indicate such conditions. . . .

**Q.** *What is the effect on safety if signals are not controlled by track circuits?*

**A.** Now the approach or distant signals are controlled by the condition of the track in advance of the signal and the condition of the home signal. The proposed rule would permit the approach signals to be so arranged that they would not reflect the condition of the track in advance of the signal. Now the controls for each automatic signal must be broken through track relays which reflect the condition of the track, i.e. track occupancy, broken rail, open switch. Under the proposed rule, no such control for these signals is provided. In other words safety is disregarded.

Abstract of Testimony, Walter P. Dunn, Locomotive Engineer, Boston and Maine.

**Q.** . . . *The proposed revision of Rule 136.201 would except all signals other than home signals from the requirements of the rules. Is it desirable to put this exception into these rules?*

**A.** No, it is not. In my opinion all signals, home interlocking and intermediate, must be controlled by track circuits. In addition, the rules should provide for the display for a stop indication for a train under the conditions stated in the rules. By requiring only a proceed-at-restricted speed aspect operations would be deprived of the protection afforded

the train by a stop indication and would subject the train to all hazards of a proceed at restricted speed indication.

Abstract of Testimony, Kenneth Clark, Locomotive Engineer, Chicago, Milwaukee, St. Paul and Pacific.

**Q.** *Do you have an opinion concerning the proposed Section 136.201?*

**A.** Yes, I do. As applied to the portion of the Milwaukee Railroad on which I work, the proposed rule apparently means this: the signal aspect red, which may mean stop and proceed or stop and stay, or, under some circumstances, reduce speed not in excess of 15 mph, would not have to be controlled by the track circuits.

As an operating railroad man, as a fireman and engineer, I am very much worried and disturbed by the proposed change. The red signal is an essential, absolutely vital part of railroading. If it is not to be given through the track circuits, then how is it to be given? There is a grave ambiguity in this proposed change which demands clarification. Remember that this rule applies not only in double-track territory but in single-track territory as well. As I read this rule, it would permit trains to be operated in opposite directions along the same line of track and yet the only signal aspects controlled by the track circuits which would need to be given would be the amber light which permits a train to proceed not in excess of 30 mph. . . .

In my opinion, the proposed revision is not merely a matter of clarification of language which has no operational significance. I am very much concerned that there is much more at stake here than a clarification of language. First of all, I don't believe that the language requires any clarification. The presence of a train in the circuit, or the presence of an open circuit causes the red light to go on. That is exactly as it should be. Under Section 136.201 as it is proposed to be revised, the presence of a train in the circuit need not automatically cause the red signal to go on. I am gravely concerned that under the rule as revised, the carriers may seek some short cut for the giving of the red signal. If, in fact, the red signal is to be given under the rule as revised, they might rely upon a train dispatcher at some remote point to give the red signal. Perhaps the carriers will take advantage of some development that we are not now informed of, which may be cheaper but which may be less safe, for the purpose of giving the red signal. I am gravely disturbed about a change in the rules which is presented as merely a clarification in language not intended to have any change in meaning but which in fact opens the door for the introduction by the carriers of changes in signal circuits which may have far-reaching significance for safety.

**136.204 Track signaled for movements in both directions, requirements.**—On track signaled for movements in both directions, a train shall cause one or more opposing signals immediately ahead of it to display the most restrictive aspect, the indication of which shall be not more favorable than "proceed at restricted speed". Signals shall be so arranged and controlled that if opposing trains can simultaneously pass signals displaying a proceed aspect and the next signal in advance of each such signal then displays an aspect requiring a stop, or its most restrictive aspect, the distance between opposing signals displaying such aspects shall be not less than the aggregate of the stopping distances for movements in each direction. Where such opposing signals are spaced stopping distance apart for movements in one direction only, signals arranged to display restrictive aspects shall be provided in approach to at least one of the signals. Where such opposing signals are spaced less than stopping distance apart for movements in one direction, signals arranged to display restrictive aspects shall be provided in approach to both such signals. (n)

absolute permissive block signaling when a train passes a head block signal it shall cause the opposing head block signal to display an aspect requiring a stop.

Abstract of Testimony, G. B. Anderson, Assistant Chief, Section of Railroad Safety, Bureau of Safety and Service, Interstate Commerce Commission.

Q. . . . Does this rule [Section 136.204] apply only to automatic block-signal system.

A. It does.

Q. . . . what are the reasons for the proposed revisions of Section 136.204?

A. In connection with the administration of this rule the question has frequently been raised as to whether or not the practice on some roads of permitting, by operating a train to pass a permissive signal (as distinguished from an absolute signal) at restricted speed without stopping, complies with the requirements of the first sentence of Section 136.204. This sentence reads as follows:

"On track signaled for movements in both directions, a train shall cause one or more opposing signals immediately ahead of it to display an aspect requiring a stop."

On some railroads it is the practice to permit a train to pass such signals at restricted speed without stopping. This practice is recognized in AAR Standard Code Rule 291, which shows the aspects, name and indication of a stop-and-proceed signal. A footnote to the rule reads as follows:

"Railroads desiring to avoid stopping trains may arrange accordingly."

The record does not indicate anything unsafe about this practice—operation at restricted speed without stopping—yet a literal interpretation of the first sentence of the present rule would preclude the use of signals displaying aspects permitting trains to proceed at restricted speed without stopping, when such signals are opposing signals immediately ahead of a train. Such an interpretation also would prohibit the use of grade or tonnage signals on track signaled for movements in both directions.

Further, there are a few installations where automatic train control or automatic cab signals without wayside signals are used on single track signaled for movements in both directions. In these installations, head block signals at the ends of passing sidings are the only wayside signals provided, the automatic cab signals taking the place of intermediate wayside signals. In such cases when a train passes a point where an intermediate wayside signal would be provided, and track conditions are such that this signal should display a stop-and-proceed aspect, the cab signal would display its most restrictive aspect, the indication of which is "proceed at restricted speed". A literal interpretation of the first sentence of Section 136.204 also would preclude the use of this aspect, since it does not require a stop, yet an aspect requiring a stop is never displayed by an automatic cab signal. The use of the restricting aspect in this case therefore, also would be a violation of the requirements of the rule.

In view of all of the foregoing, the first sentence of Section 136.204 has not been interpreted to preclude the use, on track signaled for movements in both directions, of automatic signals permitting operation at restricted speed without stopping, the use of grade or tonnage markers on automatic signals that permit a train to pass such signals without stopping when they display stop-and-proceed aspects, or the use of an aspect permitting operation at restricted speed as the most restrictive aspect of an automatic cab signal. It is therefore proposed that the rule be revised so as to clarify its intent to permit these practices.

The last sentence of the rule as proposed was added in order to insure that in absolute permissive block signaling the head block signals would display aspects requiring a

stop as their most restrictive aspects. In order to clarify this requirement it is now proposed that the last sentence of the rule be further revised to read as follows:

"In absolute permissive block signaling when a train passes a head block signal it shall cause the opposing head block signal to display an aspect requiring a stop."

It should be noted that this rule as finally revised does not permit any change in the basic requirements or in the fundamental protective features which are requisites for single track signaling, whether it be designed on the overlap or the absolute-permissive-block principle. It simply takes cognizance, in the wording of the rule, of operating practices which have been in use for many years and which have not been found to be hazardous in any way.

The footnote to the present rule has been eliminated since it is no longer applicable.

Q. Mr. Anderson, what is a head block signal?

A. A head block signal is a signal on the main track at the leaving end of a passing siding governing movements into the block extending to the next passing siding in advance, which is an absolute block for opposing movements.

Q. What is the purpose of the last sentence of Section 136.204, as finally proposed?

A. The purpose of this sentence is to insure that each head-block signal shall be an absolute signal for opposing movements, or in other words that it display a stop or a stop-and-proceed aspect, rather than a proceed-at-restricted speed aspect, when the absolute block in which it governs movements is occupied by an opposing train.

Abstract of Testimony, Warren H. Pelton, Locomotive Engineer, Missouri Pacific.

Q. In regard to the proposed revision of Section 136.204, do you have an opinion concerning the changes proposed for this rule?

A. Yes. I consider that the revised Section 136.204 does not provide for a safe method of operation. . . . Under the revised sections, the opposing signals may display an aspect "proceed at restricted speed". The result is that you can have two trains in the block proceeding in opposite directions toward each other, one of which may be going at normal speed and the other of which may be going as fast as 15 mph. This is an inherently unsafe situation.

Q. Do the remaining portions of the proposed rule provide protection against the situation that you have just mentioned?

A. No. The next sentence of the rule relates to the situation where trains going in opposite directions simultaneously pass signals, each displaying proceed aspects. Under such circumstances the present rule provides that the intermediate signals between the two trains display aspects which will cause the two trains to stop short of a collision. But the situation which I was talking about a moment ago was not the case where two trains simultaneously pass signals displaying proceed aspects, but the situation where, let us say, a northbound train passes a signal on a proceed aspect. Under the present rules a southbound train then would be required to stop and would not be allowed to enter the block. As the northbound train approached the point where the southbound train was held up by the signal, it, too, would receive a stop aspect. This provides positive protection against head-on collisions. But under the revised section the southbound train would not be required to stop, but would be allowed to proceed at restricted speed. Thus, you have the situation which I described a moment ago of two trains headed in opposite directions approaching each other.

**To be continued  
in August issue.**