

**DEPARTMENT OF TRANSPORTATION
Federal Railroad Administration**

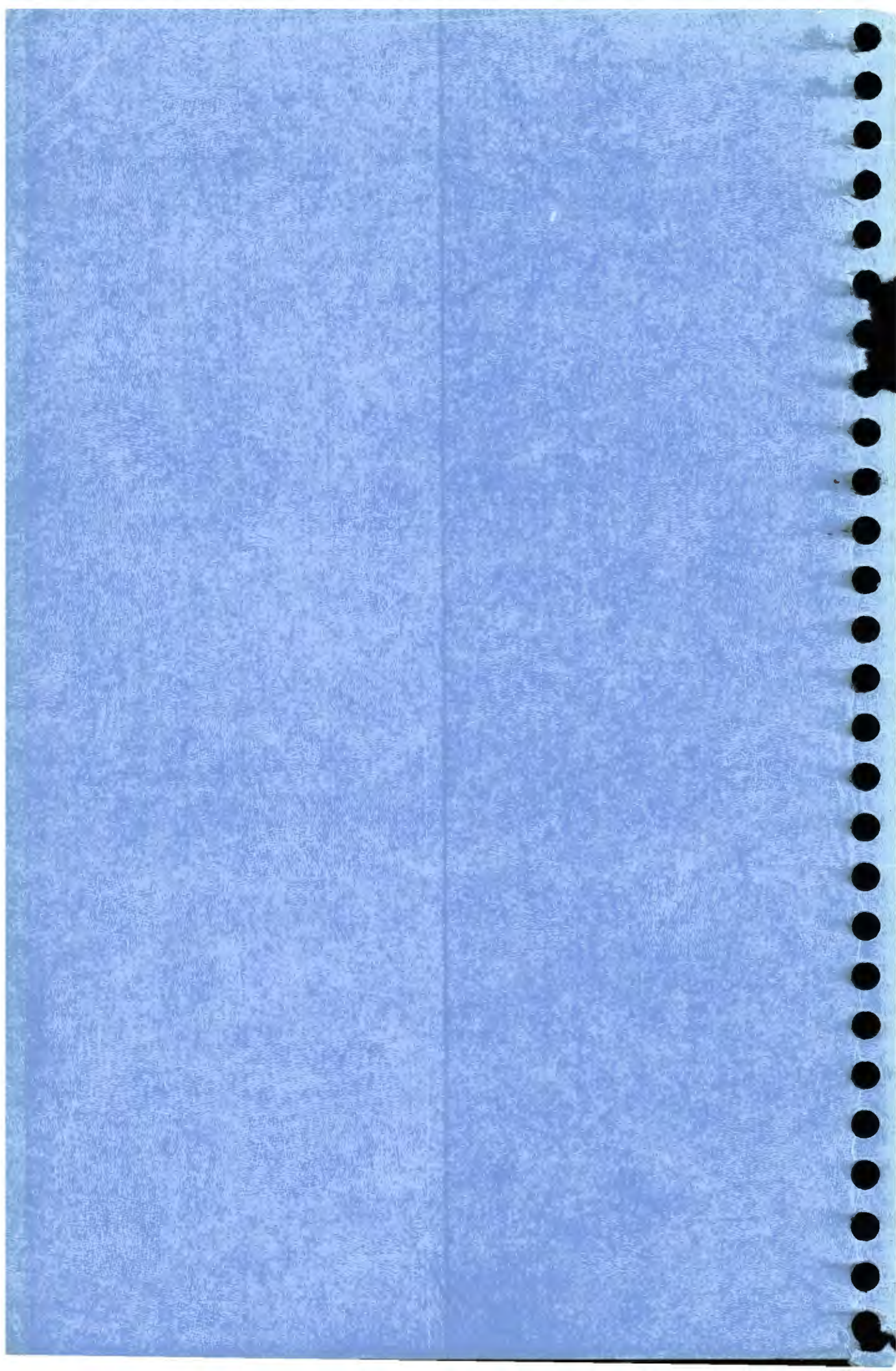


**TECHNICAL MANUAL
For
Signal and Train Control Rules
Covering
Signal Reporting Requirements
Instructions Governing Applications
For Approval Of A Discontinuance
Or A Material Modification Of
A Signal System Or Relief
From Part 236
Rules, Standards, And Instructions
Governing The Installation, Inspection,
Maintenance, And Repair Of
Signal And Train Control Systems,
Devices And Appliances.**

Print Date 9-92

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PART 233 - SIGNAL SYSTEM REPORTING REQUIREMENTS

233.1 Scope.

This section identifies the systems, methods, and appliances that are subject to the reporting requirements.

Application:

This rule subjects automatic block signal systems, traffic control systems, interlockings, automatic train stop, train control, and cab signal systems or other similar appliances, methods, and systems to the reporting requirements of this part.

An automatic block signal system is a block signal system wherein the use of each block is governed by an automatic block signal, cab signal, or both.

A traffic control system is a block-signal system under which train movements are authorized by cab signals or block signals whose indications supersede the superiority of trains for both opposing and following movements on the same track.

A nonautomatic block signal system is a term used to denote any method of maintaining an interval of space between trains as distinguished from an automatic block system, a traffic control system, an automatic cab signal system without roadway signals, or time interval system.

An automatic train stop system is a system so arranged that its operation will automatically result in the application of the brakes until the train has been brought to a stop.

An automatic train control system is a system so arranged that its operation will automatically result in the following:

(a) A full service application of the brakes which will continue either until the train is brought to a stop, or under control of the engineman, its speed is reduced to a predetermined rate.

(b) When operating under a speed restriction, an application of the brakes when the speed of the train exceeds the predetermined rate and which will continue until the speed is reduced to that rate.

Automatic train control systems includes those systems referred to as speed control systems.

An automatic cab signal system is a system which provides for the automatic operation of the following:

(a) Cab signal, a signal located in engineer's compartment or cab, indicating a condition affecting the movement of a train and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals, and

(b) Cab indicator, a device located in the cab which indicates a condition or a change of condition of one or more elements of the system.

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Section 233.1 Scope.

This section does not now clearly establish that all signal and train control systems are subject to this Part. The proposed change specifically sets forth those methods, appliances and systems that are subject to the FRA's reporting requirements, which clarifies and simplifies the matter.

Section 233.1 - Scope.

FRA proposed to revise this section to clearly identify those methods, appliances, and systems that are subject to the reporting requirements contained in this Part. One commenter objected because the requirements of this Part do not include rail/highway grade crossing warning devices. It was the commenter's view that railroad companies should be required to report failures of rail/highway grade crossing warning devices to function as intended because intrusion of highway motor vehicles upon railroad rights-of-way often results in train damage and/or crew death or injury.

Rail/highway grade crossing warning devices are not within the scope of the NPRM, which focused not on grade crossings but on block signal systems, interlockings, automatic train stop, train control, and/or cab signal devices, and/or other similar appliances, methods, and systems used for the safe operation of trains. Therefore, there is no procedural basis for including rail/highway grade crossing warning devices in this proceeding and the rule is adopted as proposed. Although this issue is beyond the scope of the notice in this proceeding, it may become an appropriate topic for future rulemaking.

233.3 Application.

This section makes this part applicable to each common carrier by rail subject to the Signal Inspection Act, 49 U.S.C. 26.

Application:

Applies to each railroad that is part of the general rail system engaged in interstate commerce. Does not apply to rapid transit system or privately-owned system not transporting interstate commerce.

Does not apply to automatic classification yards or to rail/highway grade crossing warning devices.

233.5 Accidents resulting from signal failure.

This section requires each carrier to report by toll-free telephone number 800- 424-0201 within 24-hours of each accident/incident resulting from a false proceed signal indication or failure.

Application:

A false proceed signal indication or a false proceed failure is the failure of an appliance, device, method, or system to function or indicate as required by the RS&I that results in either a more favorable aspect than intended or a condition that is hazardous to the movement of a train.

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Section 233.5 Accidents resulting from signal failure.

The current provisions of section 233.5 do not comport with similar requirements in the FRA's Accident/Incident Reporting Requirements (49 CFR 225) and the FRA's Railroad Locomotive Safety Standards (49 CFR 229). The proposed revision will achieve a standardized reporting requirement in the several disciplines within the FRA. Thus, this revision will reduce the reporting burden currently placed on the railroad industry.

CLASSIFICATION OF DEFECTS

5.01 Accident/incident resulting from or involving failure of appliance, device, method, or system to function or indicate as intended, not reported to FRA within 24 hours after accident/incident.

233.7 Signal failure reports.

This section requires each carrier to report within 15 days each false proceed signal indication or failure.

Application:

A false proceed signal indication or a false proceed failure is the failure of an appliance, device, method or system to function or indicate as required by the RS&I that results in either a more favorable aspect than intended or a condition that is hazardous to the movement of a train.

This rule requires that each false proceed failure, including those resulting in an accident/incident, to be reported to FRA within 15 days on Form FRA F 6180-14 in accordance with the instructions contained on the form.

Section 233.7 Signal failure reports.

This section currently requires each respondent railroad to report each failure of an appliance, or of a device, method or system to function or indicate as intended in a manner detrimental to the safety of train operation within 5 days of the failure. In addition, if no such failure occurs within a calendar month, each carrier is required to report that fact.

The proposed revision would provide 15 days within which each such failure must be reported. The agency has found that 5 days frequently does not provide sufficient

The proposed revision would provide 15 days within which each such failure must be reported. The agency has found that 5 days frequently does not provide sufficient time in which to determine the cause of such failures. Therefore, 15 days is a more logical time frame in which to make such a determination, prepare the report and allow it to reach the FRA. Further, the proposed revision eliminates the requirement for a negative report during months in which no failure occurs. The proposed changes will further reduce the paperwork burden now placed on the railroad industry by the current rule as prescribed in the Paperwork Reduction Act of 1980, Pub. L. No. 511, 96th Cong., 2d sess. (1980), 94 Stat. 2812, 44 U.S.C. 3502 et seq. However, the railroads should be aware that under this proposed revision all failures of appliances, devices, methods or system to function as intended must be reported. The FRA feels the proposed changes provide the carriers with more latitude under the requirements, but due to the recognized seriousness of such failures, the FRA must insist that each report of a failure be documented.

Section 233.7 - Signal failure reports.

FRA proposed to extend from 5 days to 15 days the time allowed for a carrier to report the occurrence of a false proceed signal failure. In addition, FRA proposed to eliminate the requirement for a negative report for the months in which no such failure occurs.

One commenter opposed the proposed changes stating that all false proceed signal failures should be reported within 24 hours, the same time frame as required for those that result in accidents. In addition, the commenter opposed elimination of the negative report because it provides FRA with a good means to monitor the effectiveness of the reporting system.

Another commenter supported the proposed changes stating the additional time would eliminate the necessity for follow-up reports. In supporting the proposed elimination of the negative report, the commenter stated that there is no need to memorialize in writing the absence of an event.

FRA provided its rationale for changing the reporting requirements of this section in the preamble to the proposed rule (48 FR 11883). None of the commenters refuted that rationale. Consequently, FRA has adopted the proposed reporting requirements without change.

A commenter questioned whether a substantive change was intended by the proposed change to this rule requiring the reporting of a failure of an appliance, device, method or system to "function or indicate as required by Part 236" instead of "indicate or function as intended." This change is an editorial one made for purposes of clarity. The requirements set forth in Part 236 establish the proper functioning of signal and train control (S&TC) systems. The failure of an appliance, device, method, or system to function or indicate as required by Part 236, which results in a more favorable aspect than intended or other condition hazardous to the movement of a train, constitutes a false proceed signal indication and must be reported to FRA. Similar language has been added to the final rule and to section 233.5 in order to clarify this intent. This change should resolve this interpretive problem.

CLASSIFICATION OF DEFECTS

7.01 Report of failure of appliance, device, method, or system to indicate or function as intended not made on prescribed form within fifteen (15) days.

233.9 Annual report.

This section requires each carrier to file an annual signal systems report.

Application:

The intent of this rule is to require an annual report of signal systems and methods of train operation no later than April 1 of each year. The report is required to be filed on Form FRA F 6180-47 in accordance with the instructions on back of the form.

Section 233.9 Annual reports.

Only a minor modification is proposed in section 233.9. Section 233.9 presently requires an annual report to be submitted by January 15 of each year. This is an extremely busy time for the railroads when they are gathering statistics, reviewing and planning budgets, and determining depreciation, taxes, and other similar matters. In order to reduce these kinds of burdens, which are associated with this seasonal workload, the FRA proposes the annual report be submitted no later than April 1 of each year, which gives these common carriers an additional two and one half months in which to accumulate the necessary information and prepare the report.

CLASSIFICATION OF DEFECTS

9.01 Annual report for preceding year not filed prior to April 1.

9.02 Annual report for preceding year not correct.

233.11 Civil penalty.

This section prescribes a civil penalty for failure to file reports as required by this part.

Application:

This rule establishes that a carrier is liable for maximum penalty of \$2,500 for each offense or failure to file reports as required. Each day a failure or refusal to file continues is a separate offense.

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Section 233.11 Civil penalty.

A significant modification is proposed for section 233.11. This section currently provides for a penalty of not less than \$250 and not more than \$2,500 for each failure to comply with this Part, 49 CFR 233.11. For all practical purposes, the relaxation of the reporting requirements proposed in section 233.7 places this industry on the honor system as far as compliance is concerned. Since this Part has been revised to eliminate costly and unnecessary burdens previously imposed on the railroads, the FRA believes that imposition of the maximum penalty -- \$2,500 -- for each failure to file the required report is necessary for the purpose of securing meaningful compliance with the safety considerations implicit in this Part.

233.13 Criminal penalty.

This section prescribes a criminal penalty for filing a false report or other document required by this part.

Application:

The rule subjects any person who knowingly and willfully makes, causes to be made or participates in the making of a false entry in an accident report, false proceed report or annual report required by this part to a fine of \$5,000 and/or two (2) years imprisonment.

HANDLING OF FALSE PROCEED SIGNAL REPORTS

In order to expedite the notification and investigation of false proceed failures, carriers have been instructed to submit false proceed reports directly to the regional offices.

Upon receipt of a false proceed report, the S&TC Specialist shall determine if the failure occurred within his region. If not, he should immediately furnish a copy of the report to the director of the region in which the failure occurred.

Failures reported by carriers that were caused by deposits on rails; defective relays, interlockings, or similar devices; broken or defective apparatus, equipment out of adjustment, circuits crossed or grounded, or undetermined, should be investigated. The S&TC Specialist in the region where the failure occurred shall determine the degree of any investigation. In addition, he shall determine if an investigation is warranted of all other such failures.

A narrative report of each false proceed investigation shall be filed. The narrative report should contain the following information:

(1) First paragraph:

Date, time, and location of failure or alleged failure.

(2) Second paragraph:

Type of system, technical description of the system, method of train operation, and maximum authorized speed.

(3) Third paragraph:

Type of train, direction, and, if freight train, number of cars in consist, weight, type and numbers of cars of hazardous materials in consist.

(4) Fourth paragraph:

Signal number, aspect displayed, device that failed, cause of failure, show how the failure contributed to the false proceed signal indication or hazardous condition.

(5) Fifth paragraph:

What carrier action was taken and when.

(6) Sixth paragraph:

What action was taken by the inspector and when.

(7) Seventh paragraph:

State here when it is determined a false proceed failure did not occur.

Use additional paragraphs for other pertinent information that may be developed.

After the fifteenth of each month, the S&TC Specialist should prepare a summary report of the false proceed signal failures reported by carriers headquartered in his region. The summary report, the original of each false proceed report, Form FRA F 6180-14, and memorandum reports of failures investigated shall be forwarded to the Chief, Standards Division, RRS-11, in Washington, D. C.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FALSE PROCEED SIGNAL REPORT

REPORT FOR (month/year)

DATE

All railroads subject to Regulations of the Federal Railroad Administration shall submit a false proceed signal report, original only, to the Federal Railroad Administration within five days after a false proceed occurs. If no false proceed occurs during any calendar month, a report showing "No Failures" must be filed within ten days after the end of the month.

REPORTING CARRIER (railroad & region or division)

Copies of this form will be furnished upon request to the Department of Transportation, Federal Railroad Administration, Office of Safety, Washington, D.C. 20590

MAIL TO

REPORTING OFFICER (signature/title)

A failure should not be counted more than one time in items 1, 2, 3, and 4; the failure should be classified under the basic system or appliance of which it forms an essential part. E.g.: assume grounds cause a block signal to indicate a false proceed causing corresponding indications of a cab signal system on each train approaching this point, such failures should be included in item 1, Block Systems.

The following abbreviations may be used in the report.

A false proceed failure is a failure of a system, device or appliance to indicate or function as intended which results in less restriction than intended.

- A—Automatic
- AB—Automatic block
- ACS—Automatic cab signal
- APB—Absolute permissive block
- ATC—Automatic train control
- ATS—Automatic train stop
- CL—Color light
- CPL—Color position light
- E—Electric
- EM—Electromechanical
- EP—Electropneumatic
- FP—False proceed
- MB—Manual block
- M—Mechanical
- P—Pneumatic
- PL—Position light
- SA—Semiautomatic
- TC—Traffic control

TYPE OF SYSTEM	DATE	LOCOMOTIVE NUMBER	DEVICE THAT FAILED	LOCATION (city and state)
1 BLOCK SYSTEMS <input type="checkbox"/> AB <input type="checkbox"/> APB <input type="checkbox"/> TC				
2 INTERLOCKING <input type="checkbox"/> REMOTE <input type="checkbox"/> AUTO-MATIC <input type="checkbox"/> MANUAL				
3 AUTOMATIC SYSTEMS <input type="checkbox"/> ATS <input type="checkbox"/> ATC <input type="checkbox"/> ACS				
4 OTHER (specify)				

NATURE AND CAUSE OF FAILURE CORRECTIVE ACTION TAKEN

(If more space is required, continue on reverse)

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

RAILROAD

SIGNAL SYSTEMS ANNUAL REPORT

REPORTED BY (Name, Title, Address)

IN SERVICE ON
JANUARY 1, 19

MAIL TO

Department of Transportation
Federal Railroad Administration
Office of Safety, RA-613
Washington, D.C. 20590

METHODS OF TRAIN OPERATION	MILES	
	Road	Track
TRAFFIC CONTROL		
AUTOMATIC BLOCK		
NON-AUTOMATIC BLOCK		
TIMETABLE AND TRAIN ORDERS		

INTERLOCKINGS MAINTAINED BY REPORTING CARRIER

CONTROLLED POINTS IN
TRAFFIC CONTROL TERRITORY

Automatic	MANUALLY OPERATED				REMOTELY CONTROLLED		Electric	Electro-pneumatic
	Electric	Electro-pneumatic	Electro-mechanical	Mechanical	Electric	Electro-pneumatic		

AUTOMATIC TRAIN STOP, TRAIN CONTROL, AND CAB SIGNAL SYSTEMS

	TRAIN STOP ONLY	TRAIN CONTROL ONLY	CAB SIGNALS ONLY	TRAIN STOP AND CAB SIGNALS	TRAIN CONTROL AND CAB SIGNALS	TRAIN STOP, TRAIN CONTROL, & CAB SIGNALS
Road Miles						
Track Miles						
Locomotives						
Motor Cars						

REMARKS

Part 235 - INSTRUCTIONS GOVERNING APPLICATIONS FOR APPROVAL
OF A DISCONTINUANCE OR MATERIAL MODIFICATION OF A SIGNAL
SYSTEM OR RELIEF FROM THE REQUIREMENTS OF PART 236

235.1 Scope.

This section identifies those changes in S&TC systems, methods, and appliances that require FRA approval, those that are exempt from approval, and provides for relief from the RS&I.

Application:

This section is applicable to all block signal systems, interlockings, traffic control systems, automatic train stop, train control, or cab signal systems or other similar appliances, methods, or systems.

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Section 235.1 Scope.

Existing section 235.1 consists of language which is vague and overly legalistic in tone. The proposed revision expresses the scope of this Part in clear and simple terms.

235.3 Application.

This section makes this part applicable to each common carrier by rail subject to the Signal Inspection Act, 49 U.S.C. 26.

Application:

Applies to each railroad that is part of the general rail system engaged in interstate commerce.

Does not apply to rapid transit systems or privately owned systems not transporting interstate commerce.

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Section 235.3 Application.

This proposed section is new and was extracted from existing section 235.1 for the purposes of clarity mentioned above.

235.5 Changes requiring filing of application.

This section prescribes application for approval of discontinuance, decrease of limits of a system, or material modification, except as exempted in § 235.7.

Application:

Except as provided in § 235.7, an application must be filed to cover the discontinuance of a block signal system, interlocking, traffic control system, automatic train stop, train control, or cab signal system or other similar appliance or device. Except as provided in § 235.7, an application must be filed to cover the decrease of the limits or modification of a block signal system, interlocking, traffic control system, automatic train stop, train control, or cab signal system.

Other similar appliances or devices are considered to be signal arrangements or protective devices such as slide detectors, high detectors, or earthquake detectors that are interconnected with a signal system.

A signal arrangement is considered to be those signaling installations such as tunnel protection, spring switch protection, etc., that govern train movements but do not meet the requirements of Subpart B, C or D.

This part does not apply to automatic classification yards or rail/highway grade crossing warning devices.

Except as provided in § 235.7, a material modification consists of but is not limited to the following:

1. Change in type of interlocking from manual to automatic or automatic to manual operation;
2. Change in type of signal system from traffic control to automatic block, interlocking to traffic control, or traffic control to interlocking;

3. Respacing projects involving the removal of signals to reduce maintenance costs; or

4. Conversion of power-operated switches/derails to hand or spring operation.

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Section 235.5 Changes requiring filing of application.

This proposed section comports with existing section 235.2. The existing provisions are difficult to interpret. The term "decrease in area covered" is subject to debate and all too often is not considered when signal changes are planned by the railroads. This proposal clarifies when an application is required subject only to the exception clause.

CLASSIFICATION OF DEFECTS

- 5.01 Discontinuance without FRA approval.
- 5.02 Decrease of the limits without FRA approval.
- 5.03 Material modification without FRA approval.
- 5.04 Noncompliance with an order approving an application.
- 5.05 Noncompliance with an order of FRA.
- 235.7 Changes not requiring filing of application.

This section specifically identifies those changes permitted without FRA approval.

Application:

Signal changes not shown in this section are considered to be discontinuances, decrease of limits, or material modifications that require FRA approval.

Section 235.7 Changes not requiring filing of application.

This proposed revision comports with existing section 235.3. The existing provisions contain the most controversial language in this Part. The requirements are broadly stated to cover varied circumstances. There are frequent misunderstandings of what constitutes a material modification, a discontinuance, a catastrophic occurrence, a track change, or closing of an interlocking or a block station.

In order to clarify those terms, proposed section 235.7 contains three paragraphs. The first paragraph, (a), addresses discontinuances and identifies those circumstances where signal systems or appliances could be discontinued or removed without the FRA's approval.

The second paragraph, (b), addresses decreases in the area covered and identifies those circumstances in which the limits of a system could be reduced without the FRA's approval. This paragraph also incorporates the provisions of the present footnote of section 236.410 that provide for removal of electric locks from hand-operated switches in traffic control territory, which further reduces the paper work and related costs presently imposed on the railroads that unnecessarily require obtaining FRA approval for removal of such locks. Further, section 236.410 will now be brief and more to the point.

The third paragraph, (c), addresses material modifications and identifies those particular signal changes that could be made without the FRA's approval.

Section 235.7 - Changes not requiring filing of application.

FRA proposed a major revision to Part 235 to, among other things, clarify the meaning of a material modification, a discontinuance, a catastrophic occurrence, and a track change. To accomplish this purpose and based on information acquired through the experience of investigating applications for changes in S&TC systems, an extensive list of changes was developed that FRA believes should not require prior approval to implement.

One commenter supported the proposed changes stating they will benefit both the industry and Federal Government by permitting the industry to proceed in a timely fashion on projects that would otherwise be delayed by the application process.

One commenter correctly pointed out that in the preamble to the proposed changes FRA did not address the proposal to permit electric or mechanical locks to be removed from hand-operated switches in automatic block signal systems (ABS) without FRA approval. The commenter is of the opinion that removal of electric or mechanical locks in ABS systems or traffic control systems (TCS) should be permitted only on a case-by-case basis. Further, it was felt that locks should be retained or installed on all switches in areas where there is a high incidence of vandalism or where high-speed passenger or commuter trains are operated. It was alleged that electric or mechanical locks on hand-operated switches would have prevented two recent serious accidents.

The purpose of electric or mechanical locks is not to secure hand-operated switches in proper position against vandalism but to preclude unauthorized intrusions of trains into ABS or TCS territory. One of the two accidents alluded to was the result of human error, the other the result of vandalism. There is no assurance a lock would have deterred the vandalism.

FRA's intent is to treat the removal of an electric or mechanical lock the same regardless of whether the hand-operated switch on which it is installed is in ABS or in TCS. This revision should clarify the procedures required for removal of such locks in ABS or TCS territory without decreasing the safety of train operation. Consequently, FRA has rejected the suggestion that electric or mechanical locks be considered as requisite devices for high speed train operation or to deter vandalism and has adopted the section as proposed.

235.8 Relief from the requirements of Part 236.

This section provides for relief from any requirement contained in the RS&I.

Application:

The provisions of this section were formerly contained in § 236.0. Relief from the requirements of the RS&I previously granted to any carrier constitutes relief to the same extent as relief granted under the requirements of this Part.

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Section 235.8 Relief from the requirements of Part 236.

For purposes of clarity, consistency and simplicity, all relief from the requirements of Part 236 is now being incorporated into Part 235. Since all other S&TC applications are filed under Part 235, this will consolidate all applications concerning S&TC systems and relief from the RS&I governing S&TC systems into one Part, 235.

235.9 Civil penalty.

This section establishes a civil penalty for failure to comply with the requirements of this Part.

Application:

Where, for any reason, a carrier does not file an application to cover a discontinuance, decrease in limits, or a material modification, this section prescribes a maximum civil penalty of \$2,500. Each day a failure to file continues is a separate offense.

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Section 235.9 Civil penalty.

This proposed section is new and will provide for the maximum penalty of \$2,500 where unauthorized changes are made in S&TC systems. The proposed modification to this Part removes costly and unnecessary burdens previously imposed on the railroads. Therefore, for the purpose of securing meaningful compliance with the very important safety requirements now contained in this Part, the FRA would seek collection of the maximum penalty of \$2,500 for each violation.

235.10 Contents of applications; and

235.12 Additional required information-prints.

These sections set forth the information that is required when submitting an application.

Application:

These sections itemize the information that is required on block signal applications and applications for relief from the RS&I.

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Section 235.10 Application format, contents.

Existing section 235.10 provides for applications to be submitted by a letter setting forth information required by section 235.11. For purposes of clarity and simplicity, the proposed modification combines the provisions of sections 235.10 and 235.11. Thus, section 235.11 would be deleted.

235.13 Filing procedure.

This section sets forth the procedure for filing an application.

Application:

This section prescribes the manner in which block signal applications and applications for relief are to be filed.

At a joint facility, where the proposed changes affect more than one carrier, the application must be executed between the joint carriers before submitting to FRA.

At a joint facility, where the proposed changes or relief sought affect only one carrier, that carrier shall certify when filing that the other joint carriers have been notified of the application.

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Section 235.13 Filing procedure.

The changes proposed in this section are the elimination of examples of numerous carrier officials who may now submit applications and the address to which the application is to be addressed. Proposed section 235.13 would simply provide for applications to be submitted by an authorized officer of the railroad.

235.14 Notice.

This section provides for the posting of a public notice in connection with the filing of each application or request for reconsideration.

Application:

The FRA will post a public notice of the filing of an application or request for reconsideration of an application in the FRA Office of Public Affairs. This public notice may be examined at FRA's Headquarters in Washington, D. C. in room 5420 during regular business hours. A copy of each public notice will be mailed to all interested parties.

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Section 235.14 Notice.

Existing section 235.14 requires the posting of a public notice to cover the filing of an application with copies to be mailed only to all interested parties. The proposed revision will also require the posting of a public notice to cover a request for reconsideration of an application. Thus, all parties would be aware of all actions by the FRA involving S&TC applications, which provides consistency in the administration of this Part.

235.20 Protests.

This section provides for the protest against granting of any application.

Application:

This rule prescribes the method and procedure for filing a protest against granting a block signal application or an application for relief from the requirements of the RS&I.

Protests not filed in the prescribed time limit may not be considered.

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Section 235.20 Protests.

The only change proposed in this section is the address to which protests are to be filed.

INVESTIGATION OF APPLICATIONS

A thorough investigation and a complete report are required on each application for relief from the requirements of the Rules, Standards and Instructions (RS&I-Ap.) and on each application for approval of a discontinuance or material modification of a block signal system, interlocking, automatic train stop, train control, and cab signal device (BS-Ap.).

The information submitted by the carrier in accordance with the provisions contained in "Instructions Governing Applications for Approval of a Discontinuance or Material Modification of a Signal system or Relief from the Requirements of Part 236", (49 CFR 235) will form the basis for report on each BS-Ap and RS&I. This information should be checked at the time of investigation to insure that it is correct for use in the preparation of the report and in order that additional information, if necessary to complete the report, may be obtained promptly. Two copies of this information are provided with each application assigned for field investigation. One copy is to be retained in the inspector's file.

Each application should be promptly investigated and field investigation report prepared and mailed in time to reach the Standards Division, RRS-11, prior to the closing date shown on the Public Notice.

The field investigation report shall be prepared on the Inspector's "Report Form for BS-Ap and RS&I-Ap Applications" according to the instructions contained herein.

On the first line, "RS&I-Ap-No." or "BS-Ap-No." should be struck out as appropriate and the docket number inserted along with the filing date as shown on the Public Notice.

On the second line, insert the inspector's name, headquarters location, and date the report is prepared.

On the third line, insert the name of the railroad filing the application. In case of joint applications, each railroad party to the application shall be shown. Do not show the name of the railroad official filing the application or the address of the carrier.

On the fourth and fifth lines, show the required information. Be sure to show the carrier or organization with which the representatives are associated.

In paragraph (a), the inspector certifies whether or not the Public Notice is correct by placing an "X" in the appropriate parenthesis. Where the Public Notice is found to be in error, the inspector should insert the correct language. It is also recommended that the inspector edit the correction into a copy of the Public Notice and return it with the report.

In paragraph (b), the inspector should identify other railroads that operate in the facilities involved through joint ownership, trackage rights, tenant agreement, switching agreement, etc., that will be affected by the proposed changes but were not shown in the Public Notice. The inspector should describe the manner in which each railroad will be affected. In addition, the inspector should determine whether the carriers have been made party to the application or duly notified of the proposed changes or relief as required.

In paragraph (c), the inspector should identify any additional documents obtained during the field investigation and included as part of the field report. A timetable, or a copy of the scheduled page involved, along with applicable special instructions should be included with each application.

Paragraphs (d) 1, 2, 3, and 4 shall be prepared on pages 1a, 1b, 1c, etc., as necessary.

In (d)1, the inspector should provide a technical description of the existing signal installation and equipment. Descriptions of terrain, methods of operation, etc., should be avoided. Examples of technical descriptions required are: "An automatic block signal system on two main tracks arranged for movements with the current of traffic having US&S P-5 colorlight type signals controlled by D.C. non-coded track and line circuits;" or, "A traffic control system on single track having US&S H-2 searchlight type signals and US&S M-23 electric switch machines controlled by D.C. coded track circuits operated from a GRS CAD control machine located in Springfield, Missouri;" or, "A manual interlocking having GRS Model 2A upper quadrant semaphore signals and GRS Model 5A electric switch machines controlled by D.C. non-coded track and line circuits operated from a 27-lever GRS Model 2 interlocking machine."

In (d)2, the inspector should clarify the proposed changes or authorization requested when the Public Notice fails to fully describe them. Do not use this paragraph for correction of mechanical errors required in paragraph (a).

Use this paragraph to describe the proposed changes where the Public Notice does not clearly do so.

In (d)3, the inspector should provide an adjective description of the present and proposed methods of operation. Do not show operating rules as methods of operation. Examples of adjective description are: "The present method of operation is by timetable and train orders supplemented by automatic block signals. The proposed method of operation is by signal indications of a traffic control system;" or, "The present method of operation is by timetable, train orders, and signal indications of an automatic block signal system on two main tracks arranged for movements with the current of traffic. The proposed method of operation is by signal indication of a traffic control system;" or, "The present method of operation is by signal indication of an interlocking and will not be affected by the proposed changes."

In the second paragraph of (d)3, the inspector should describe the number of trains or other movements in the area involved.

Train averages should be based on a 30-day period that is representative of normal traffic. Avoid periods having seasonal traffic, such as detours. Train movements should be expressed distinguishing passenger trains from freight trains. Train movements may be expressed in columned format or adjectively. Where the average number of trains is less than one daily, show the average number per week.

Where there are numerous switching movements in terminal or yard areas, the number of switch engine assignments daily may be shown.

The last paragraph of (d)3 should address speed restrictions and authorizations. The present and proposed maximum authorized speeds should be shown. Where various speeds are prescribed for different trains, the trains should be identified, e.g., passenger trains, TOFC or van trains, hazardous materials trains, and other freight trains but not including work trains, cranes, scale cars, etc. Speed restrictions that have a bearing on the proposed changes should be identified.

In (d) 4, the inspector should state in the first paragraph whether or not the National Railroad Passenger Corporation (Amtrak) operated trains over the trackage involved in the application on February 1, 1979.

The second paragraph of (d)4 should show the number of hazardous materials cars transported annually over the trackage involved in the application.

When applicable, the third paragraph of (d)4 should show the BS-Ap or RS&I-Ap number filed concurrently with the application.

In subsequent paragraphs of (d)4, the inspector should provide additional information he deems necessary to fully understand the proposal such as changed traffic patterns and their causes, design problems, maintenance practices, obsolescence, vandalism, etc.

On page 2, the inspector should complete items (e) and (f) on BS-Ap's only.

In (e)1 describe the work, if any, found accomplished in connection with the proposed changes.

In (e)2, the inspector should provide complete details on proposed changes found placed in service without approval. Use additional pages if more space is needed, numbering them 2a, 2b, 2c, etc.

In (f), the inspector should show whether or not the proposed changes of a BS-Ap will comply with the requirements contained in RS&I. If not, identify the rule number and provide details on the deficiency.

In (g), the inspector should express his opinion about how the proposed changes will affect the safety of train operation. The inspector must state the reasons on which he bases his opinion. The inspector's opinion and reasoning should not be based on personal preferences but fairly and impartially within the provisions contained in the RS&I and safe train operation.

In (h), the inspector must provide a recommendation as to the disposition of the application. Keep in mind this is where the initial agency policy begins concerning the proposed changes. The inspector may recommend approval of the application be granted; approval of the application be granted in part, denied in part; approval of the application be denied; or, approval of the application be granted with provisions. The inspector must state the reasons upon which he bases his recommendation. Where provisions are recommended, the inspector should clearly support the need for each provision. Use additional pages

if more space is necessary, numbering 2a, 2b, 2c, etc.

Inspectors are encouraged to insert appropriate information on the plans furnished with the applications. Notations on the plans are to be made in lead pencil and initialed. In no case shall a plan be marked in color.

Every March and September, inspectors shall submit Progress and Completion Report, Form FRA F6180.50 for each BS-Ap until completed. Progress and Completion Reports are not required for RS&I-Ap's.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

Inspectors Report Form For BS-Ap-And RS&I Applications

Report in re: RS&I-Ap-No. _____
BS-Ap-No. _____ Date filed _____

From Inspector _____ Place _____ Date _____

Railroad filing application:

Inspection: Date Location Railroad and other representatives

Furnish the following information:

- (a) Description of proposed changes or relief sought, location with respect to place and operating division, and mileage between designated places is correctly stated in Public Notice (), or should be changed to read as follows: ():

- (b) Name of any other railroads affected by proposed changes not shown in Public Notice and manner in which each is affected:

- (c) List of prints and any bulletins, orders timetables, etc., obtained during investigation:

- (d)
 1. Brief description of existing installation and equipment.
 2. Information relative to proposed changes not fully described in the Public Notice.
 3. Present and proposed method of operation, number of trains

or other movements per day, and speed authorizations and restrictions.

4. Other pertinent facts or remarks.

(Use additional blank sheets, numbering 1a, 1b, etc.)

(Information covered by Items (e), and (f) to be furnished in BS-applications only)

- (e) 1. If field work has been started, nature of work performed up to date.
- 2. If any of the proposed changes have been placed in service, give description of such changes, date such changes were placed in service and the reasons for making the changes before approval of the application.

- (f) Will proposed changes conform to rules, standards and instructions?
If not, state the rule number and in what respect they fail to conform.

- (g) Inspector's opinion as to whether proposed changes will:
 - 1. Reduce protection and safety;
 - 2. Provide adequate protection for existing operating conditions without materially reducing safety;
 - 3. Maintain existing protection and safety;
 - 4. Increase protection and safety;State reasons:

- (h) Inspector's recommendation as to disposition of application.
State reasons:

Inspector

**Part 236 - RULES, STANDARDS AND INSTRUCTIONS GOVERNING
THE INSTALLATION, INSPECTION, MAINTENANCE AND REPAIR OF
SYSTEMS, DEVICES, AND APPLIANCES**

236.0 Applicability of this Part.

This section specifies that the Rules, Standards and Instructions (RS&I) apply to each common carrier by rail subject to the Signal Inspection Act, 49 U.S.C. 26, and prescribes criteria requiring the installation of block signal systems, automatic train stop, train control, or cab signal systems.

Application:

This rule requires that a block signal system complying with the RS&I or a manual block system complying with the provisions of this section be installed where passenger trains operate at 60 or more miles per hour or freight trains operate at 50 or more miles per hour. Further, an automatic train stop, train control, or cab signal system shall be installed where any train operates at 80 or more miles per hour.

This section details how a manual block system shall operate and requires that it be permanently in effect, i.e., all trains must be operated by manual block system rules.

This section does not authorize the discontinuance of any signal system without FRA approval.

NPRM
Federal Register
March 21, 1983

SECTION-BY-SECTION ANALYSIS

Order 13413

Order 13413 was issued by the ICC in 1922 under the applicable provisions of section 26 of the Interstate Commerce Act of 1920. The Signal Inspection Act of 1937 contains identical language. Thus, Order 13413 should have been closed long ago. Since the pertinent language in the Interstate Commerce Act of 1920 is expressly covered by the Signal Inspection Act of 1937, the FRA proposes to permanently close Order 13413.

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Order 29543

The FRA is proposing to codify the provisions of Order 29543 under the applicable provisions of section 236.0 of this NPRM. By this action, the FRA also proposes to permanently close Docket No. 29543.

Section 236.0 Applicability of this Part, relief and instructions governing applications for relief.

The existing section 236.0 prescribes the rules, standards and instructions for each carrier subject to the Interstate Commerce Act. In addition, the current provisions provide for the granting of relief from the requirements and sets forth the procedures to be followed when relief is sought.

Interested parties, namely the AAR and the RLEA, have proposed that FRA continue the existing requirements with some modification for purposes of clarity. These parties also recommend that the provisions contained in ICC Order 29543, which by virtue of the Department of Transportation Act of 1966 (49 U.S.C. 1651-59) is now administered by the FRA, be codified into this section. The FRA feels that merely codifying Order 29543 into this section with the existing requirements will cause considerable confusion about the overall requirements of the section. Therefore, for purposes of clarity the FRA proposes to move the provisions for relief from section 236.0 to Part 235. This action would put all requirements and instructions pertaining to S&TC block signal applications and applications for relief from the RS&I into one Part, 235. Accordingly, section 236.0 would be recaptioned as it would contain only provisions of applicability and the codified requirements now contained in Order 29543; 273 I.C.C. 660 (1949); 268 I.C.C. 547 (1947).

Originally there was a wide disparity in the recommendations of the parties to codify Order 29543. The AAR recommended that block signal systems not be required except where trains would be operated at a speed of 60 or more miles per hour and that automatic cab signal, train stop or train control system not be required except where trains would be operated at a speed of 100 or more miles per hour.

The RLEA originally recommended that block signal systems be required where trains would be operated at a speed of 30 or more miles per hour; that automatic cab signal, train stop or train control system be required where trains would be operated at 50 or more miles per hour; and that such systems be required where hazardous

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materials would be hauled over Class 2 track or better.

The parties carefully reconsidered this matter and determined that the existing requirements of Order 29543 are adequate in today's railroad environment. The requirements of Order 29543 have served well as the criteria to determine the need for signaling systems. The parties recommend that the existing requirements of Order 29543 be codified without change.

In Order 29543 the ICC found that fast transportation is desirable, but the safety of passengers and employees must come first. This consideration is still essential. Accordingly, the FRA proposes to codify the provisions of Order 29543 into the proposed section 236.0.

The proposed change would subject the RS&I contained in this Part to each common carrier by rail subject to the Signal Inspection Act, 49 U.S.C. 26. In addition, the proposed change would establish speed limits for passenger trains and freight trains that cannot be exceeded except by the installation of a manual block system that conforms to the requirements contained in this section, or, by the installation of a roadway block signal system that conforms to the requirements contained in this Part. Finally, the proposed change would establish speed limits for all trains, above which an automatic train stop, automatic train control or automatic cab signal system will be required.

The remaining proposed changes merely clarify that nothing in this Part authorizes the discontinuance of systems covered by this Part without the express written approval of the FRA.

Section 236.0 - Applicability of this Part.

FRA proposed to move the provisions for relief from this section to Part 235 and to codify Order 29543 in this section thus identifying criteria used to require the installation of S&TC systems. These criteria establish certain speeds at or above which trains may not be operated without a manual block system or S&TC systems prescribed by this Part.

One commenter recommended that a national standard be adopted requiring cab signaling and automatic speed control (automatic train control (ATC)) where one passenger train per track per hour is scheduled during major portions of the day, or four passenger trains per hour are operated during peak (rush) hours. That commenter stated that automatic cab signals (ACS) alone or ACS with automatic train stop (ATS) was insufficient to afford proper accident protection or minimization.

During the public hearing a commenter objected to the provision that requires ACS, ATS, or ATC devices where trains operate at a speed of 80 or more miles per hour. The commenter recommended that the requirements be based on the braking capabilities of various types of equipment and trains which would permit certain trains to operate at a speed exceeding 80 miles per hour without ACS, ATS, or ATC.

In rebuttal, another commenter stated that he was unalterably opposed to raising the speed criteria and that, if any changes are to be made, the speeds should be lowered. The commenter supported codification of the requirements into this section without change in its content or meaning.

The purpose of an ACS system is to provide continuous information to engineers about block conditions rather than their receiving such information intermittently at wayside signal locations. The ACS system functions to keep engine crew members not only informed but also alert. When the cab signal changes to a more restrictive aspect, an audible indicator is sounded in the cab until a crew member operates a button or lever to silence it. Where ATS or ATC is also used,

the device will function to stop the train or reduce its speed to the prescribed rate if the crew member fails to acknowledge and/or obey the more restrictive indication within the prescribed time. These systems have long been recognized as necessary to assure safe operation of trains at high speeds.

The speed provisions contained in Order 29543 have remained unchanged since being issued in 1947. Different speeds, both higher and lower, were suggested at the time the order was being considered. During the interim years, there have been recommendations both to raise and to lower the speeds. For nearly 35 years no compelling arguments have been presented that support either change.

FRA finds that no new or significant facts have been presented here that support a change of speeds at or above which ACS, ATS or ATC systems must be installed. It has been FRA's experience that the current criteria are appropriate for the safety of train operation. Therefore, this section has been adopted as proposed.

In adopting the provisions of Order 29543 in the final rule, FRA has reworded and recaptioned section 236.0 to more clearly specify the requirements contained in the order. Although reworded and restructured, section 236.0 contains the same intent and provisions expressed in the NPRM and Order 29543.

CLASSIFICATION OF DEFECT CODES

- 0.01 Block signal system not installed or manual block system not permanently in effect on line where freight train operates at 50 or more miles per hour.
- 0.02 Block signal system not installed or manual block system not permanently in effect on line where passenger train operates at 60 or more miles per hour.
- 0.03 Manual block system provided where freight train operates 50 or more miles per hour not permanently in effect.
- 0.04 Manual block system provided where passenger train operates 60 or more miles per hour not permanently in effect.
- 0.05 Manual block system permits a passenger train to be admitted without flag protection to a block occupied by another train.
- 0.06 Manual block system permits a train to be admitted without flag protection to a block occupied by a passenger train.
- 0.07 Manual block system permits a train to be admitted without flag protection to a block occupied by an opposing train.
- 0.08 Manual block system permits a freight train entering a block occupied by preceding freight train to exceed a speed prepared to stop within one-half the range of vision.
- 0.09 Manual block system permits a freight train entering a block occupied by preceding freight train to exceed 20 miles per hour.
- 0.10 Automatic cab signal, train stop, or train control system not provided where train operates at 80 or more miles per hour.

SUBPART A - RULES AND INSTRUCTIONS ALL SYSTEMS GENERAL

236.1 Plans, where kept.

Plans are necessary for the installation, inspection, maintenance, and repair of signal systems and are required to be correct and legible.

Applications:

Track layout plan, circuit plan including circuits to approach signals, locking sheet and dog chart where mechanical locking is used, shall be kept at each interlocking.

Circuit plan including circuits to approach signals shall be kept at each controlled point.

Circuit plans shall be kept at each automatic signal in automatic block signal territory, traffic control territory, automatic train stop, train control, or signal territory in other systems such as spring switch protection, slide protection, etc.

Plans are required to be legible and correct. Plans that are torn, faded, or those having experienced more than one change in colored pencil are not considered to be legible and correct.

Section 236.1 Plans, where kept.

The current rule names in detail the various plans required to be kept and also requires a copy of those plans to be kept at many specified field locations, divisional, regional and system offices.

The proposed rule would provide that the necessary plans for proper maintenance of the subject S&TC system will be available for use at each automatic signal, controlled point and interlocking. While the proposed rule would reduce the regulatory burden by eliminating the requirement for plans at certain locations mentioned above, which is costly and unnecessary, there would be no diminution in safety since the field personnel will have ready access to the plans referred to in section 236.1. It is clear that the proposed rule would include track layout plans, circuit plans, locking sheets, dog charts and profiles, as appropriate. Such plans would also be maintained in the carrier's system office and would be correct, legible and available for use by the FRA's representatives as required by the existing rule.

CLASSIFICATION OF DEFECTS

- 1.01 Track layout plan not kept at interlocking.
- 1.02 Circuit plan not kept at interlocking.
- 1.03 Locking sheet and dog chart not kept at interlocking where mechanical locking is used.
- 1.04 Circuit plan not kept at controlled point.
- 1.05 Circuit plan not kept at automatic signal.
- 1.06 Track layout plan for interlocking not correct.
- 1.07 Circuit plan for interlocking not correct.
- 1.08 Locking sheet and dog chart for interlocking where mechanical locking is used not correct.
- 1.09 Circuit plan for controlled point not correct.
- 1.10 Circuit plan for automatic signal not correct.
- 1.11 Profile plan not correct. (Includes plan not drawn to scale or not showing location of all signals, grades and alinement).
- 1.12 Track layout plan for interlocking not legible.
- 1.13 Circuit plan for interlocking not legible.
- 1.14 Locking sheet and dog chart for interlocking not legible.
- 1.15 Circuit plan for controlled point not legible.
- 1.16 Circuit plan for automatic signal not legible.
- 1.17 Profile plan not legible.
- 1.18 Profile plan not available.

236.2

Grounds.

Vital circuits shall be kept free of grounds equal to or in excess of 75% of the release value of relay or electromagnetic device in circuits. Track circuits, common return wires of single-wire, single-break signal control circuits grounded by design, and alternating current power distribution circuits grounded in the interest of safety are excluded.

Application.

Vital circuits designed to be ground free are required to be kept free of any ground current in excess of 75% of the release value of any relay or electromagnetic device in the circuit. There is no difference between an accidental or intentional ground.

Extreme care shall be exercised when testing for grounds. Carrier employee shall perform test. Testing shall not be conducted while trains are approaching or passing, meter shall be watched at all times, and if it indicates the energization of a relay, immediately disconnected. An unobserved meter shall never be left connected to a vital circuit and ground.

Ground test shall be performed at every instrument case or house inspected. The preliminary test shall be with a voltmeter connected from line or track arrestor ground to a track circuit which will prove the meter is operating and the integrity of the ground circuit.

AC power shall be interrupted during tests in order to check AC lighting circuits having DC stand by.

These requirements apply to highway grade crossing warning devices, dragging equipment protection, etc., where signal control circuits are selected through relays energized by the power supply of such protection.

Work to correct a ground should begin immediately upon detection.

RULE 136.2

It is proposed that this rule be revised to add new matter to the extent indicated by the underlined portion below:

SUBPART A. RULES AND INSTRUCTIONS, ALL SYSTEMS GENERAL

xxx.

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 percent 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.

The record in this proceeding is lacking in background facts pertaining to this rule. The report accompanying the Commission's order of June 29, 1950, indicates that there was no objection to the rule, as then proposed, no discussion was necessary, and it was adopted without discussion. Apparently it grew out of a rule of similar import passed in 1939 but even this is not clear from the instant record or from this Commission's files. In any event the Commission's Rules, Standards and Instructions published April 13, 1939, effective September 1, 1939, contained the following plainly stated rule which was probably the predecessor to the 1950 rule:

RULES AND INSTRUCTIONS - ALL SYSTEMS GENERAL

xxx.

11. Circuit shall be kept free of grounds which may interfere with proper operation.

This rule was not continued after 1950, but the following was established:

SUBPART A, RULES AND INSTRUCTIONS, ALL SYSTEMS GENERAL

xxx.

136.2 Grounds. Each circuit, the functioning of which affects 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 percent of the release value of any relay or other electromagnetic device in the circuits, except circuit which includes any track rail.

Now it is proposed that the following be added to the just quoted rule:

(the word "circuit" is changed to plural "circuits," in the last phrase and then follows the additional phrases) 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.

For clarity, it is well to state in different words the 1950 rule and the proposed changes. Basically, the rule requires, as did the 1939 rule, that circuits be kept free of grounds. Then follows one exception, namely, a circuit which includes track rail. Now we have two more exceptions which may be numbered exceptions two and three, and for focusing purposes they will be indented and restated:

- (2) except the common return wires of single-wire, single-break, signal control circuits, using a grounded common, and
- (3) except alternating current power distribution circuits which are grounded in the interest of safety. (The word except as here underlined is added here for clarity)

The main problem in this case concerning rule 136.2 is proposed exception (2).

This record indicates that the present rule 136.2 passed in 1950, overlooked a very significant segment of signalling then in use on the nation's railroads, that it did not necessarily intend to outlaw that particular signalling, and that the Commission's motivation for the now proposed exception (2) is to correct the situation overlooked in 1950. The fact is that since 1937 or earlier, and continuously since, there has been in use on the railroads of this nation several thousands of miles of signalling, now up to over 4,000 miles, having grounded common return wires within the purview of this rule. The non-compliance of this signalling was apparently brought to the attention of the Commission's Bureau of Safety and Service subsequent to 1950 but the Bureau concluded, again apparently, that no safety hazard was presented, that the passage of the rule without the exception was an oversight, and that no attempt should be made to require removal of the grounds. The position of the Bureau continues to be that such intentionally grounded circuits could not result in an unsafe situation and that they should be affirmatively and positively allowed, rather than informally approved as in the past.

The Southern Pacific is one of the railroads having a great deal of signalling within the purview of proposed exception (2). It has had this signalling since at least 1937 and has never experienced a false clear signal resulting from the grounded common return wire. Its overall experience with the signalling in question is entirely favorable.

The record here contains some conflicting testimony relative to whether the addition of exception (2), and the grounding of common return wires of single-wire, single-break signal control circuits using a grounded common could, in actuality, result in a false signal less restrictive than intended, but this is apparently due to some initial misunderstanding as to the scope of the proposed exception. The exception would not permit the grounding of two-wire polarized circuits such as those causing some apprehension by the RLEA. The matter of crosses between wires, as contrasted with grounds, is also an important distinction to be made regarding this rule. In addition to its lack of concurrence respecting the technical workings of the type of signalling considered under exception (2), the RLEA urges that this signalling is obsolete, that it is not apt to be installed to any significant extent in the future, and that it is poor administration of the Signal Act to pass rules aimed merely at saving certain obsolete facilities. This is a very noteworthy position on this particular problem but the following statement of the Bureau's position, on the same question, is equally meritorious, see page 807 of the transcript:

Anderson. xxx.

Now, it was not my intention in Exhibit No. 2 to depict a circuit which the Commission would recommend to be installed at the present time, nor to advocate the use of such a circuit. Exhibit No. 2 was intended only to show why such circuits are grounded in the interest of safety, and why such a practice should be permitted, since they obviously are safer with the common intentionally grounded than without such grounds. I pointed out in my testimony that such circuits are not in general use, and I agree with Mr. Best that they are obsolete, but we have many circuits and much equipment that is obsolete in service at the present time. It is desirable that such circuits and equipment be made to operate as safely as possible until such time that they can be replaced; and for this reason the common return circuits shown in Exhibit 2 should be permitted to be grounded.

Proposed exception (3) is not as strongly contested as is exception (2) but it is, nevertheless objected to. Basically the position of the RLEA aside from its general objection, is that exception (3) should be adopted only if the rule further requires that a signal circuit fed from a grounded distribution circuit be isolated through the use of transformers or other similar devices. The Bureau does not appear to object to this counter-proposal on the part of the RLEA but contends that it is entirely unnecessary. According to the Bureau, such circuits as are involved in this exception are never connected directly to any signal control circuits

for the reason that the voltage must always be reduced by means of a transformer before it is suitable for use in this type of circuit. It is generally an accepted practice in the electrical field that alternating current power distribution circuits be grounded.

Discussion and Findings - Rule 136.2. The Examiner agrees with the Bureau that the thousands of miles of existing signalling coming under the terms of proposed exception (2) may properly be allowed to remain in service at the carriers' discretion. The passage of the exception would merely clarify what has already been in existence under color of right for many years. The fact that the exception may become surplus in years to come, because of the fast obsolescence of the type, is no reason to cause a problem over it now. Its safety is satisfactorily shown. Respecting exception (3), it is clear that this proposed change is in consonance with accepted practice in the electrical field and that it should be approved. It would make no difference were the transformer requirement added, as suggested by the RLEA, but there is no good reason to spell out an obvious requirement such as this. The Examiner finds that adequate safety and protection would be continued under proposed rule 136.2, that its enactment would be in the interest of safety and in the public interest, and that it should be adopted.

Rule 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 percent of the release value of any relay or other electro-magnetic 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.

The essential difference between the present and proposed rule is the inclusion in the latter of two additional exceptions.

RLEA opposes the first new exception because of apprehension that the grounding of the common return wires of single-wire, single-break, signal control circuits, using a grounded common, could actually result in a false indication less restrictive than intended. RLEA also contends that the term "common return" requires clarification and interpretation. With respect to present installations, it suggests that the carriers either be granted specific individual relief or that the installations that may retain the grounded common return be specified. The position of the Bureau is that such intentionally grounded circuits could not result in an unsafe situation. RLEA's opposition is apparently due to a misunderstanding as to the scope of the proposed exception which would not permit the grounding of two-wire polarized circuits the unsafe situation feared by RLEA.

RLEA asserts that the second exception should be added only if the rule also requires that a signal circuit fed from a grounded distribution circuit be isolated through the use of transformers or other similar devices. The record indicates that such circuits are never connected directly to any signal control circuits for the reason that the voltage must always be reduced by means of transformers before it is suitable for use in this type of circuit. Moreover, it is a generally accepted practice in the electrical industry that alternating current power distribution circuits be grounded.

We are satisfied that the meaning of the two proposed exceptions is clear and unambiguous and that additional provisions suggested by RLEA are not necessary. We find that the proposed exceptions will not impair safety and that the rule proposed should be adopted.

CLASSIFICATION OF DEFECTS

2.01 Circuit grounded sufficiently to permit flow of current equal to or in excess of 75% of release value of relay or other electromagnetic device in circuit.

236.3 Locking of signal apparatus housing.

Housings of signal apparatus shall be secured to prevent unauthorized entry.

Application:

All outdoor housing of mechanical or power-operated devices used to operate signal or interlocked units must be kept locked, sealed, or secured. This includes signal cases, instrument cases, switch circuit controllers, facing point locks, switch machines, junction or terminal boxes and battery boxes.

Power interlocking machine cabinets shall be locked or sealed to such extent that entry to or manipulation of the devices contained in the cabinet can only be accomplished by unlocking the lock or breaking the seal.

Time release and exposed electric locks must be locked or sealed.

Cabinets or cases containing apparatus designed to release locking in emergencies shall be locked or sealed.

Wrench or nut-locking with bell is acceptable.

Section 236.3 Locking of instrument cases and interlocking machine cabinets.

The present rule requires the use of locks or seals on specific types of signal housings. The rule also excepts signal mechanism housings at interlockings where maintenance forces are continuously on duty.

The proposed rule leaves to the managerial discretion of the carrier the specific manner in which the signal housings are secured and the rule will apply to all signal housings. The proposed rule also removes the exception regarding signal mechanisms at interlockings where maintenance forces are continuously on duty. Since all the housings will now be secured, it should reduce vandalism -- frequently a problem -- and be of economic benefit to the carriers.

The proposed rule would apply to power interlocking machine cabinets, time releases, emergency releases, and electric locks on interlocking machines; all such devices would be required to be secured. That requirement is consistent with the present rule. Certain traffic control machines and electric cabinets do not contain apparatus that, if interfered with by unqualified personnel, would result in an unsafe condition. Thus, such machines and cabinets would not be covered by the proposed rule.

CLASSIFICATION OF DEFECTS

- 3.01 Signal case not secured against unauthorized entry.
- 3.02 Instrument case not secured against unauthorized entry.
- 3.03 Power interlocking machine cabinet not secured against unauthorized entry.
- 3.04 Time release not secured against unauthorized entry.
- 3.05 Exposed electric lock not secured against unauthorized entry.
- 236.4 Interference with normal functioning of device.

Safety of train operation must be provided before interfering with the normal functioning of any device.

Application:

The intent of this rule is to insure carriers maintain the integrity of signal systems by prohibiting procedures or practices which defeat or nullify the minimum requirements of the RS&I.

Interference is any condition that circumvents, hinders, impedes, or diminishes whatsoever the intended protection of a device and may be accomplished by testing, installing, repairing, replacing, operating, or manipulating a signal component indicating or affecting the indication of safe passage for trains. There is no difference between accidental or intentional interference with respect to the enforcement of this rule.

Tests of signal equipment should not be conducted until it has been ascertained no train movements will be affected. No test should be conducted during the passage of a train, Hi-rail vehicle or motor car.

Areas where interference can occur include all components, devices, mechanisms, or apparatus in vital circuits including shunt and fouling wires of switches and turnouts.

Unless measures are taken to provide safety of train operation, the following are some examples of interference with various types of equipment and procedures:

1. Testing such as falsely energizing relays, jumpering contacts, turning relays upside down; operating hand-operated switch, adjusting switch circuit controller or shunting fouling circuit, in advance of approaching train; operating power-operated switch without permission of dispatcher or operator; performing ground tests while train is approaching or moving over power-operated switch; defeating predetermined time interval of time release or time relay; and release of electric or mechanical locking.
2. Performing efficiency tests by removal of lamp bulbs that do not provide an approach aspect to the darkened signal; placing a shunt in advance of a signal after a train has passed its approach signal.
3. At interlockings, the unnecessary breaking of seals to force indications, defeat time, approach or route locking requirements. Note: The procedure to move trains through interlockings under flag protection and appropriate rules is not considered interference.
4. Defeat of protective features to avoid train delay or to expedite train movements such as disconnecting shunt or fouling wires, turning relays upside down, jumpering contacts, falsely energizing relays or circuits, or releasing electrical locking.

The following will be considered interference under all circumstances:

Performing repairs and replacements such as relays, cables, and conductors without proper testing

afterwards; replacing rails in shunt fouling circuits leaving fouling wires and rail bonds broken and disconnected; replacing ties under switch machines and switch circuit controllers leaving the circuit controller improperly adjusted; and leaving a switch in mid-stroke position.

Section 236.4 Interference with normal functioning of device.

The parties suggested that the words "for insuring" be deleted and the phrase "to provide for" be substituted in its place. The FRA agrees to the proposed editorial change.

CLASSIFICATION OF DEFECTS

4.01 Interference with normal functioning of device without taking measures to provide safety of train operation.

236.5 Design of control circuits on closed circuit principle.

This rule requires that control circuits which affect the safety of train operation be designed on the closed circuit principle.

Application:

Excludes circuits for roadway equipment of intermittent automatic train-stop system, normally open track circuits used to energize signal lamps when occupied, and fouling circuits.

Includes all vital circuits and track circuits through which signal control circuits are selected. Circuits should be so designed that failure of any part or component of the circuit will cause signals to display their most restrictive aspects.

CLASSIFICATION OF DEFECTS

5.01 Control circuit, the function of which affects safety of train operation, not designed on closed circuit principle.

236.6 Hand-operated switch equipped with switch circuit controller.

Hand-operated switch equipped with switch circuit controller connected to the point, or hand-operated switch with facing point lock and circuit controller, is required to shunt track circuit or open control circuits, or both, when point is open one-fourth inch or more on facing-point switch and three-eighths inch or more on trailing-point switch. Facing-point lock shall be so adjusted that it

cannot be locked when point is so opened. Circuit controllers, facing-point locks, and switch-and-lock movements, and their connections must be securely fastened in place. Contacts must open at least one-sixteenth inch.

Application:

This rule does not apply to power-operated switches, spring switches, or electric locks on hand-operated switches.

Test should be made by placing appropriate gage between point and stock rail six inches from point and applying pressure against the gage until it cannot be removed.

Where control circuits are opened through switch circuit controller or through switch repeating relay, it is not a requirement that shunt wires be provided or that shunt wires be doubled.

Rule 136.6

The only change proposed in this rule is indicated by the underline:

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 one-fourth inch or more on facing-point switch and three-eighths inch 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 one-sixteenth inch when open.

In its administration of this rule the Bureau has found that the last sentence of the rule is sometimes misinterpreted by some as applying to interlocked switches. This occurs despite the clearly stated title of the section. To make it assuredly clear, the words "On such hand-operated switch" are added. All the parties herein agree with this change, and the Examiner accordingly finds for its adoption.

Section 236.6 - Hand-operated switch equipped with switch circuit controller.

Although FRA did not propose any change to section 236.6, one commenter recommended that the section be revised to clearly require that a switch circuit controller on a hand-operated switch be connected to the normally closed switch point, and to extend the requirements of this section to switch points operated by a switch-and-lock movement.

FRA has in the past and will continue to require each switch circuit controller to be connected to the switch point over which train movements are governed by signal indications. In addition, the provisions of section 236.6 apply to facing-point locks which are hand-operated switch-and-lock movements. Power-operated and mechanically-operated switch-and-lock movements are subject to the provisions contained in Subpart C of this chapter. This information should allay the interpretive concerns of the commenter. The commenter correctly pointed out that section 236.6 is not addressed in this rulemaking proceeding, and the recommendations are rejected accordingly.

CLASSIFICATION OF DEFECTS

- 6.01 Switch circuit controller on hand-operated facing-point switch not adjusted to shunt track circuit or open control circuits when switch point is open one-fourth inch or more.
- 6.02 Switch circuit controller on hand-operated trailing-point switch not adjusted to shunt track circuit or open control circuits when switch point is open three-eighths inch or more.
- 6.03 Hand-operated facing-point switch equipped with facing-point lock and circuit controller can be locked when switch point is open one-fourth inch or more.
- 6.04 Hand-operated trailing-point switch equipped with facing-point lock and circuit controller can be locked when switch point is open three-eighths inch or more.
- 6.05 Switch circuit controller not securely fastened in place.
- 6.06 Facing-point lock not securely fastened in place.
- 6.07 Switch-and-lock movement not securely fastened in place.
- 6.08 Contact opening of switch circuit controller contact less than one-sixteenth inch.
- 6.09 Switch circuit controller connections not securely fastened.
- 6.10 Switch-and-lock movement connections not securely fastened.
- 6.11 Facing-point lock connection not securely fastened.
- 6.12 Switch circuit controller not connected to normally closed switch point.

236.7 Circuit controller operated by switch-and-lock movement.

Circuit controller operated by switch-and-lock

movement is required to be maintained so that normally open contacts will remain closed and normally closed contacts will remain open until switch is locked.

Application:

Applies to hand-operated, mechanical, or power-operated switch-and-lock movements including such machines as M-22, M-23, 5, 55, T-20, etc. Before locking bar is completely withdrawn from lock rod, normally closed contacts must open and normally open contacts must close and remain so until locking bar has again engaged lock rod.

CLASSIFICATION OF DEFECTS

7.01 Contacts of circuit controller operated by switch-and-lock movement not adjusted so that normally open contacts remain closed until the switch is locked.

7.02 Contacts of circuit controller operated by switch-and-lock movement not adjusted so that normally closed contacts remain open until the switch is locked.

236.8 Operating characteristics of electromagnetic, electronic, or electrical apparatus.

Operating characteristics of electromagnetic, electronic, or electrical apparatus in service shall be in accordance with the limits within which it is designed to operate.

Application:

Rules 101, 102, 105, 106, 107, 108, 109, 551, 552, 588, and 589 address those devices so important to safety of train operation that periodic tests are required to ascertain that operating characteristics remain unchanged.

Applies to all electromagnetic, electronic, or electrical devices used in or associated with vital circuitry or switch machine operation.

Each carrier should have specifications setting forth the pick-up values, release values, working values, and condemning limits of these values for all electromagnetic, electronic, or electrical devices in use on their property. Some examples of deficient operating characteristics are:

- a. Pick-up value too high.
- b. Pick-up value too low.
- c. Release value too high.
- d. Release value too low.

Manufacturer specifications or carrier standards compatible with manufacturer specifications shall be used to determine such values.

Some examples of electromagnetic devices covered by this rule not requiring periodic tests are:

- a. Switch machine controllers.
- b. Thermal relays of switch machine controllers.
- c. Indicating magnets on interlocking machines.
- d. Coils of forced drop electric locks.

Section 236.8 Operating characteristics of electromagnetic,
electronic or electrical apparatus.

The present rule applies only to electromagnetic apparatus but does not adequately address electronic devices currently used in railroad signaling.

The proposed modification would require that all electromagnetic and electronic devices or their components be maintained in accordance with the limits within which such apparatus is designed to operate.

This change would permit management to utilize the newest technological advances and encourage innovation by the carriers to obtain economic savings without any reduction in the existing level of safety of train operation.

CLASSIFICATION OF DEFECTS

- 8.01 Pick-up value of electromagnetic device not in accordance with the limits within which it is designed to operate.
- 8.02 Drop-away value of electromagnetic device not in accordance with the limits within which it is designed to operate.
- 8.03 Working value of electronic or electrical apparatus not in accordance with the limits within which the apparatus is designed to operate.

236.9 Selection of circuits through indicating or annunciating instruments.

Signal control and electric locking circuits are required to be selected through contacts of safety relays.

Application:

This rule does not prohibit the use of annunciating or indicating devices, but does prohibit selecting vital circuits through them.

Some examples of annunciating or indicating devices are:

- a. Switch indicator
- b. Block indicator
- c. Cab indicator
- d. Approach indicator
- e. Track indicator
- f. OSing device
- g. Semaphore indicator
- h. Manually-operated calling-on device.

Test such devices that are in non-compliance by manually moving indicator to energized position

and observing if armature and contacts are actuated. If so, contacts of such devices may not be used in vital circuitry.

CLASSIFICATION OF DEFECTS

- 9.01 Signal control circuit selected through contacts of indicator or annunciator in which the indicating element attached to the armature is arranged so that it can in itself cause improper operation of the armature.
- 9.02 Electric locking circuit selected through contacts of indicator or annunciator in which the indicating element attached to the armature is arranged so that it can in itself cause improper operation of the armature.

236.10 Electric locks, force drop type; where required.

This rule requires that electric locks applied to new installations and new electric locks applied to existing installations be of the forced-drop type.

Application:

Applies to all electric locks installed after October 1, 1950, on new locations.

Applies to all electric locks on hand-operated switches and interlocking machines.

Tests should be made to determine that the locking dog is forced down into the locking sector. This test can be made by observing movement of the locking dog as the switch lock is locked in normal position.

Since most forced-drop type locks are spring loaded, they should be checked to determine that the spring is of sufficient strength so that normal operation does not release the locking dog unless the lock is energized.

A nonforced-drop electric lock may be removed from service, repaired and restored to service only by replacing another nonforced-drop type electric lock.

RULE 10

This rule reads as follows: "Electric locks on new installations and new electric locks applied to existing installations shall be of the forced-drop type." The only railroad objecting to it is the Chicago, Burlington and Quincy, hereinafter referred to as the Burlington. Its objection is that electric locks of the forced-drop type should not be required on hand-operated switches for the reason that it knows of no manufacturer making electric locks of the forced-drop type for such switches. When advised that at least one manufacturer makes a lock for hand-operated switches that will meet the requirements of this rule, its objection is withdrawn.

CLASSIFICATION OF DEFECTS

- 10.01 Electric lock not forced-drop type. (Applies only to electric lock installed after October 1, 1950.)
- 10.02 New electric lock applied to existing installation not forced-drop type.
- 236.11 Adjustment, repair, or replacement of component.

This rule requires a carrier to determine the cause of a signal aspect that is not in accordance with known operating conditions and requires that a failed signaling component which adversely affects safety of train operation be adjusted, repaired, or replaced without undue delay.

Application:

A signal aspect "not in correspondence with known operating conditions," means a signal aspect other than that intended by normal signal system operation.

A carrier is required to determine the cause of each "stop" or "stop and proceed" aspect resulting from an unknown condition. If that condition is the result of the failure of a signaling component and is a hazard to the safety of train operation, corrective action is required before the next train movement. Should train operation require night-time or weekend corrections, they must be made.

Conditions which cause false stop or false restrictive indications may cause inconvenience and additional expense to train movements. Examples of such conditions that do not necessarily pose a threat to safety of train operation are a burned out lamp, a broken track connector, or a broken line wire.

Applies to adjustable components which, when improperly adjusted, creates a safety hazard such as circuit controller, point detector and lock rod adjustments exceeding the requirements; insufficient predetermined time intervals; and excessive track circuit values.

Applies to components which, if not repaired, creates a safety hazard such as grounded circuits, insecure circuit controllers, switch machines, pipeline carriers and cranks; bent; worn or insecure connecting rods, lock rods, and point detector rods.

Applies to components which, if not replaced, creates a safety hazard such as broken connecting rod, lock rod, point detector rod, pipeline, or crank; broken fouling wires, shunt wires, and bond wires in fouling circuit; defective relays, cable, and conductors.

Test equipment and instruments are excluded.

RULE 136.11

This is one of the more controversial of the involved rules. The 1939 rules had the following provisions, of undetermined pertinence here but of some general interest:

RULES AND INSTRUCTIONS ALL SYSTEMS GENERAL

xxx.

4. Defective apparatus or parts shall be promptly replaced and record made of such replacement.

6. In case of severe storm, inspection shall be made as soon as practicable and any trouble corrected.

8. In case of failure or damage to apparatus which cannot be repaired immediately and which may affect safety of train operation, signals or other controlling devices shall be arranged to provide protection until the condition is corrected.
9. In case broken rail, wide gage or other condition is discovered which may affect safety of train operation, steps shall be taken immediately to protect trains by flag, signals, or other controlling devices; record of the defect shall be made and the defect remedied as quickly as possible.

These were not continued after 1950 and the following was then adopted similarly captioned:

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.

Here is the change now proposed, the underlines representing proposed new words and phrases, similarly captioned:

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.

The main change here in controversy is the substitution of the phrase, "Without undue delay" in lieu of the word "promptly". Insertion of the phrases limiting the application of the rule to something effecting the safety of train operation and the exclusion of track rails are secondary, but still controverted, changes in this rule. The use of the word "component" in the place of apparatus is not seriously in issue. According to the Bureau, this section originally was intended to insure that if a piece of signal apparatus, such as a relay, a switch circuit controller, an electric lock, a switch-and-lock movement, or some other generally similar device or apparatus was found defective to such an extent that it failed to perform its intended function, it must mandatorily, be adjusted, repaired or replaced as soon as practicable. However, this rule had been the subject of more varied interpretations than any other rule in the entire series and its administration has become increasingly difficult. The rule has been interpreted rather broadly by some to mean that signal maintenance forces must be called immediately, day or night, during regular duty hours or during overtime hours, to investigate and correct all signal interruptions or signal failures. The Bureau points out that 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 that a signal maintainer should not be called in every instance at midnight or noon, regardless of the time, when a signal may display a stop aspect for no apparent reason; that there are many conditions under which a signal may display a stop aspect, other than block occupancy; that if a switch is left open, or in 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 the intent behind Section 136.11; that much difficulty in administering the present rule stems from interpretation of the word "promptly"; that some have insisted that "promptly" be interpreted to mean "at once" or without delay; that it is not always possible, even with the best of intentions, to repair or replace a piece of apparatus without any delay; that in this respect the present rule cannot be complied with literally, and 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.

The Bureau has also experienced difficulty with interpretation of the word "apparatus". On this point it urges that apparatus is defined as a complex 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 it has been confronted with an interpretation problem over whether apparatus include such things as bond wires and track rails. It does not consider a bond wire or a rail to be a piece of apparatus but they are deemed 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. The Bureau takes the position that this change actually broadens the scope of the rule because component is more comprehensive

than apparatus. However, although, a track rail is a component of a track circuit, and hence a signal system, the Bureau would exclude track rails from 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. The Bureau further points out that to comply with other requirements of the Commission's Rules, Standards and Instructions, a signal must display its most restrictive aspect when a rail is broken in the block of 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 word "component" in the revised rule, because there are many situations where the safe movement of trains 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.

The heart of the intent behind this rule is to require a defective component, the failure of which would allow a false proceed signal, to be repaired promptly, or at least prior to the next train movement over the involved line. There is no intent, here, to hasten the repair of false stop signals or to require the repair of false stop signals or other signal facilities prior to normal duty hours when no movement is to occur over the line until normal duty hours or for some significant time to come.

The protestants object to the exclusion of track rails from the scope of this rule. They urge that track rails are an essential part of signal systems; that track rails are conductors for track circuits; that safe track rails are essential to the safety of train operations; and that track rails must perform their intended function as certainly as any other component in the system.

Protestants also object to the phrases "the proper functioning of which is essential to the safety of train operation," contending this leaves too much to on-the-spot personal and individual judgment. On the no-requirements-for-repair-before-next-train proposal the protestants insist that an emergency may require movement of a train over a particular track at any time, for example, on a Sunday morning, though the track may normally be unused over the entire weekend. They also insist that a dispatcher may be forced because of hot boxes, dragging equipment or other defective equipment to change the meeting points of trains and thus force the unexpected use of certain sidings. In any event they insist that the suggested change from "promptly" to "without undue delay" would be no improvement in reality, would result in more problems of interpretation than does the present phrase "promptly". They emphasize that the phrase "without undue delay" carries with it the clear meaning that some delay is permitted. Their basic position on this issue is that the repairs should be made at once regardless of circumstances.

In rebuttal to the evidence of the protestants regarding the exclusion of track rails from this rule, the Bureau agrees wholeheartedly with the RLEA

that track rails are essential and integral components of a signal system as they are indispensable parts of the track circuit. Though agreeing with this concept, the Bureau, nevertheless, insists that track rails should be excluded for the reason that their maintenance and repair are not the responsibility of signal maintenance forces. The Bureau may have envisioned track rails and their repair as coming within the jurisdiction of this Commission in 1939, but it does not now see this jurisdiction despite the essentiality of track rails to signal systems and safe train movements. Emphasizing the practical problem here involved, the Bureau agrees that defective track rails must be repaired or replaced as soon as possible but it reiterates that they cannot be repaired by signal maintenance forces.

Discussion and Findings - Rule 136.11. The first of the 4 changes proposed in this rule, that is changing "apparatus" to "component", makes it broader and more comprehensive and no serious objection is directed against it. In the circumstances, and since clarity of administration will be enhanced, it will be adopted.

The next proposed change is another matter entirely. Track rail is, of course, a most essential component of a signal system. It is almost illogical on its face to repeatedly stress the safe movement of trains, signal-wise, on the one hand, while affirmatively excluding track rails, a conductor of the signal circuit and also the most fundamental of all things for the movement of trains, on the other. The question of who repairs the track rails, whether signal forces, or maintenance of way forces, has nothing to do with the Commission's jurisdiction or responsibility in this matter.

The practical problem exists, true, but it is not a remover of jurisdiction, nor a justifiable basis upon which to avoid responsibility. Moreover, it is interesting to note that track rails were specifically included in the 1939 rules under precisely the same jurisdiction and responsibility that we have now, that they were not treated specifically, either way, in 1950, but that here we have a complete about face and now they are to be specifically excluded. At the same time, the record is completely and fatally silent on why they were included in 1939, and handled silently in 1950. The evolution of this type of rule is important not only for understanding but for the evaluation of experiences of the industry, and the Bureau, under the respectively different requirements. The Examiner finds that the record fails to support this part of the changes proposed.

The whole theme of the Signal Act, and the Commission's rules and regulations thereunder, is to promote the safety of train operations. There is no intention to interfere with carrier management and discretion except where or when it is necessary to assure the safety of railroad operations. Therefore, the insertion here proposed "the proper functioning of which is essential to train operation" is squarely in consonance with the true purpose and objective of the Signal Act and our rules and regulations thereunder. The fact that a false stop or false restrictive signal may cause great inconvenience and expense seems to require its prompt repair as a matter

Rule 11

Adjustment, repair or replacement of apparatus component.
Any piece of apparatus or any part thereof which 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 promptly adjusted, repaired or replaced without
undue delay.

A threshold question in connection with this rule is presented by the AAR's argument that the Commission must except track rails from the purview of rule 11 because they are used primarily for the purpose of carrying trains and because track maintenance, as such, is not within the Commission's jurisdiction. AAR, however, concedes that track rails may be considered components of a signal system when the rails are used for carrying current in a signal system but argues, in effect, that track rails, even when so used, are not subject to section 25.

When used for signalling, the intended purpose of track rails is threefold; they carry the current for the signal circuit, they indicate through a shunt or short circuit that a train or car is occupying a particular section or block of track, and they indicate that a section of rail is broken except in certain circumstances.³ The essence of the AAR's position is that the Commission has no authority to impose rules on rail carriers respecting repair of a broken rail which has caused a signal to display a restrictive aspect and has thus functioned as intended. But, when track rail normally used to carry current for a signal system is broken and causes a signal to display a restrictive aspect it no longer functions as intended for it can no longer carry the current for the signal system. In other words, the track rail component of the signal system when broken and caused a signal to display its most restrictive aspect has served one part of its intended function but it can no longer serve another part of its intended function. The AAR's argument to the effect that the Commission has no jurisdiction to require repair of a broken track rail which normally functions as a component of a signal system is contrary to section 25 which, as here pertinent, provides that a signal system may not be discontinued or materially modified without approval of the Commission.

³Certain breaks in track rail are not capable of being reflected in the signal system because the break is incomplete or because such devices as tie plates, joint bars or guard rails provide a bypass for the current.

236.11 Adjustment, repair, or replacement of component.

Section 136.11, (now section 236.11) which has been very controversial, was adopted in 1950 to consolidate four separate 1939 rules referring to replacement or repair of defective signal apparatus. Section 136.11 required "Any piece of apparatus or any part thereof which fails to perform its intended function shall be promptly adjusted, replaced, or repaired."

In 1964 certain changes were proposed in section 136.11. The main change was to add the phrase "without undue delay" and delete the word "promptly". The proposed rule would read: "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." The discussions and findings of the ICC hearing officer in 1964 were (1) that changing the word "apparatus" to "component" clarified the rule and should be adopted; (2) that a change to exclude track rail from the rule was discussed; (3) that the whole theme of the Signal Inspection Act and the duly adopted rules and regulations is to promote the safety of train operations and the proposed language "the proper functioning of which is essential to the safety of train operation" was perfectly consistent with the true purpose and objective of this Act and the rules and regulations promulgated thereunder; (4) that "the fact that a false stop or false restrictive signal may cause great inconvenience and expense seems to require its prompt repair as a matter of efficient management" but on the record then before the Examiner it did not appear to pose a safety problem; and (5) that the purpose of substituting "without undue delay" for the word "promptly" was to clarify the situation regarding the need to repair a signal system outside of normal working hours. Simply stated, the intent of this rule was that repairs or adjustments be made before the next movement over the line. Finally, the Examiner then found that, in the best interests of safety and clear and effective administration of this rule, the phrase "without undue delay" should be adopted and so interpreted. No final action was taken on the 1964 proposal until 1966.

During the 1966 hearings on this matter the question of repair of broken rails was again discussed. The AAR

submitted that the Commission did not have the authority to require a carrier to repair a broken rail.

In response to this position the Commissioners of Division 3 stated in their report: "The AAR's argument to the effect that the Commission has no jurisdiction to require repair of a broken track rail which normally functions as a component of a signal system is contrary to section 25 which, as here pertinent, provides that a signal system may not be discontinued or materially modified without approval of the Commission.

"In order to insure that rule 11 is not susceptible of a construction that it applies to tracks generally, we believe that the language of the present rule should be clarified by adding 'signaling' before 'function' and our order will so provide. This modification should dispel the fears of the AAR that rule 11 goes beyond the Commission's authority in section 25.

"Rule 11 was promulgated to insure that if a piece of signal apparatus, such as a relay, switch circuit controller, an electric lock, a switch-and-lock-movement or some other similar device was found defective to such an extent that it failed to perform its intended function, it should be adjusted, repaired or replaced as soon as practicable." 329 I.C.C. 717, 722-723 (1966).

The interpretation of the phrase "without undue delay" was defined by the ICC. At page 723 of 329 I.C.C., the ICC said: "We find that the record does not support a rule which would require that repairs be made before the next movement in all situations. Such a rule would be unduly restrictive since adequate temporary safety measures can be taken until necessary repairs are made. We further find that the phrase 'without undue delay' is a reasonable provision considering the infinite variety of factual situations in which Rule 11 is applicable." Thus, the present rule was adopted in 1966 after consideration of the historical data and the summation of the 1964 and 1966 hearings.

The proposed changes in this rule at this time would require a carrier to investigate and determine the cause of each signal aspect that is not in accordance with known operating conditions. The regulatory language was proposed by the parties. The FRA has seriously considered the matter and agrees to include the suggested language to obtain assurance that a "stop" signal or a "stop and proceed signal," which is caused by an unknown condition, will require the carrier to determine the reason for such signal aspects. If that condition affects the safety of train operation, action would be required to correct that condition.

Section 236.11 - Adjustment, repair, or replacement of component.

FRA proposed to change this section to provide a clearer understanding of the action required where a signal malfunction occurs. The proposed changes will require carriers to investigate and determine the cause of each signal aspect that is not in accordance with known operating conditions.

One commenter stated that the term "undue delay" is used in a very specific way and recommended defining it in a footnote or in the definitions subpart of this Part (49 CFR 236, Subpart G) to ensure the railroads' understanding of it.

As detailed at length in the preamble of the NPRM (48 FR 11885), the phrase "without undue delay" was defined when it was adopted. Nothing proposed here changes that definition. The significant change proposed here is the requirement to determine the cause of each improper signal aspect. This is a novel requirement and one FRA believes will result in corrective action of defective conditions more promptly than in the past. Consequently, FRA has adopted the section as proposed.

CLASSIFICATION OF DEFECTS

- 11.01 Component, essential to the safety of train operation, failing to perform its intended function not adjusted without undue delay.
- 11.02 Component, essential to the safety of train operation, failing to perform its intended function not repaired without undue delay.
- 11.03 Component, essential to the safety of train operation, failing to perform its intended function not replaced without undue delay.
- 11.04 Cause not determined for signal component out of correspondence with known operating conditions.

236.12 Spring switch signal protection; where required.

This rule prescribes signal protection for spring switches in interlockings; and for spring switches installed after October 1, 1950 in automatic block signal, trainstop, train control or cab signal territory where movements over the switch exceed 20 miles per hour.

Application:

This rule prescribes where spring switch protection is required. Rules 236.13 and 236.14 prescribes how it will operate.

On all spring switches installed after October 1, 1950, in automatic block signal, trainstop, train control, and cab signal territory where the speed exceeds 20 miles per hour, signal protection is required in the facing and both trailing routes.

Protection is required only with the current of traffic on track signaled for movement in one direction.

Protection is required for movements against the current of traffic from the reverse main of main tracks to a single main track.

Section 236.12 Spring switch signal protection; where required.

This rule, as originally adopted on June 29, 1950, provides that spring switches installed after the effective date, October 1, 1950, would be provided with signal protection. All such installations in service before that date would be exempted from these requirements.

The parties have agreed to propose deleting from the rule the phrase "hereafter installed" and, in lieu thereof, to add the following note:

"Note: Does not apply to spring switch installed prior to October 1, 1950 in automatic block signal, automatic train stop, train control or cab signal territory."

This will clarify the intent of this section that only spring switches installed after the original adoption of the rule would be subject to these requirements.

CLASSIFICATION OF DEFECTS

- 12.01 Signal protection not provided for facing movements through spring switch within interlocking limits.
- 12.02 Signal protection not provided for trailing movements through spring switch within interlocking limits.
- 12.03 Signal protection not provided for trailing movements through spring switch in automatic block signal, train stop, train control, or cab signal territory where train movements over switch exceed 20 m.p.h. (Applies only to spring switch installed after October 1, 1950.)
- 12.04 Signal protection not provided for facing movements over spring switch in track signaled for movements in both directions within automatic block signal, train stop, train control, or cab signal territory where train movements over switch exceed 20 m.p.h. (Applies only to spring switch installed after October 1, 1950.)

236.13 Spring switch; selection of signal control circuits through circuit controller.

This rule requires that control circuits of signals governing facing movements over a main track spring switch be selected through the switch circuit controller or a relay repeating the position of such circuit controller.

Application:

This rule applies only to automatic block signal and other protective systems. Rules 236.303 and 236.342 apply to spring switches in interlocking and traffic control systems.

This rule requires point protection for facing movements over spring switch. Trailing protection is not required.

Control circuits for facing movements must be selected through either switch circuit controller or track relay where switch shunting circuit is used.

This rule applies to spring switch provided with signal protection in non-signalized territory. It does not require such protection be provided, but if so, such protection must meet these requirements.

Test of spring switch shall be made by placing one-fourth inch gage six inches from switch point on either the normal or reverse side and then placing the spring switch throw lever in either the full normal or reverse position.

CLASSIFICATION OF DEFECTS

13.01 Control circuits of signal governing facing movements over main-track spring switch not selected through contacts of switch circuit controller or through contacts of relay repeating the position of switch circuit controller.

13.02 Signal governing facing movements over main-track spring switch does not display its most restrictive aspect when normally closed switch point is open one-fourth inch or more. (Does not apply where separate aspect is displayed

for facing movement over the switch in the reverse position.)

13.03 Signal governing facing movements over main-track spring switch in both the normal and reverse positions does not display its most restrictive aspect when the switch points are open one-fourth inch or more from either the normal or reverse position.

236.14 Spring switch signal protecting; requirements.

This rule prescribes how spring switch signal protection required by Rule 236.12 shall operate in automatic block signal territory when it governs movements with the current of traffic from a siding to main track signaled for movements in one direction; when it governs movements from a siding to a main track signaled for movements in either direction; and when it governs movements at the end of double track territory signaled for movements in either direction to single track territory. It permits the use of approach or time locking.

Application:

Applies to automatic block signal territory only.

Paragraph (a) sets forth the requirements for signals governing movements from siding to main track signaled for movements with the current of traffic.

Paragraph (b) sets forth the requirements for signals governing movements against the current of traffic from the reverse main of main tracks to single track or from siding to main track signaled for movements in either direction when block into which signal governs is occupied by preceding trains and by opposing trains.

Paragraph (c) sets forth the requirements for signals governing movements against the current of traffic from the reverse main of main tracks to single track or from siding to main track signaled for movements in either direction when a train is approaching the switch within 1,500 feet in approach of the approach signal located stopping distance from the main track signal governing trailing movements over the spring switch. Tests to determine compliance with paragraph (a) should be conducted by placing a shunt in the block of the signal governing movements from siding to main track. The signal should then be observed to determine its aspect is not more favorable than "Proceed at Restricted Speed."

Tests should then be made by shunting each track circuit on the main track, from at least 1,500 feet in approach to the approach signal to the main track signal governing trailing movements over the switch. The leave siding signal should be observed to determine that its aspect is "STOP" when each track circuit is shunted. This test procedure is the same whether the main track signal governing trailing movements over the switch is located adjacent to the leave-siding signal or located a mile or more in approach of the switch.

A time release, push button or key release may be provided that, when operated, causes the main track signal to indicate "Stop" and permit the leave siding signal to clear after a predetermined time interval.

Test to determine compliance with paragraph (b) should be conducted by making an operational shunt test in approach to and then in the block of the main track signal governing trailing movements over the switch into single track and observing the reverse main or leave siding signal aspect to determine it is not more favorable than "Proceed at Restricted Speed" for a following movement. Test should then be made by making an operational shunt test on single track in the facing direction and observing the reverse main or leave siding signal aspect to determine it is "Stop" for an opposing movement.

Tests to determine compliance with paragraph (c) should be conducted by making an operational shunt test from at least 1,500 feet in approach to the approach signal to the main track signal governing trailing movements over the switch and observing the reverse main or leave siding signal aspect to determine that it indicates "Stop" until the switch is passed.

Rule 14

The only railroad objecting to this rule is the Great Northern, and it objects only to paragraphs (a) and (c).

It requests that the rule be rewritten to permit a method of signal protection at spring switches now used on that railroad and submitted a proposed revision which would permit the continued use of its present method of protection.

The purpose of this rule is to prevent a train moving out of a siding, or from a reverse main track at the end of a double track, in front of another train closely approaching in a trailing direction. The rule recognizes that a train should be permitted to proceed from a siding and follow a preceding train into a block but only under conditions that are considered safe. The system in use on the Great Northern provides essentially the same protection as rule 14 so far as maintrack trailing movements at a spring switch are concerned, but does not provide as great a degree of safety as rule 14 in the following respects:

A train on the main track is much more likely to receive a signal requiring a stop without first having passed a signal indicating that a stop will be required at the next signal under the system in use on the Great Northern than under a system designed to meet the requirements of Rule 14.

The special instructions under which the Great Northern's system is operated provide in part as follows:

A switch indicator consisting of a single yellow light unit (normally dark) and a switch-key controller mounted on an iron mast located at clearance point of a siding, must be operated by a member of the crew who, together with engineer, must observe and be governed by its indication before fouling main track or making movement from siding to main track through a spring switch in automatic block signal territory, unless movement is made immediately after an opposing train has passed the switch and automatic signal at leaving end of siding indicates "Proceed."

Under these instructions, an indication (a normally dark indicator) requires a stop under some conditions and permits a train to pass it without a stop under other conditions.

The revision of the rule submitted by the Great Northern makes no provision for following moves. As pointed out above, it is safer that such moves be made only under the conditions set forth in the rule.

The Great Northern's suggested revision of the rule would not provide as great a degree of safety as is desirable. A system installed in compliance with the rule can be made just as flexible, so far as train operation is concerned, as the system in use on the Great Northern, and, so far as future installations are concerned, any additional expense necessary to meet the requirements of the rule will not be unduly burdensome.

As to existing installations, it is recognized that there may be some where the protection provided so closely approaches that required under rule 14 that relief from a requirement that they be brought into exact compliance with the rule may be warranted. The rule has, therefore, been modified to the extent of adding a note to the rule with respect to existing installations.

CLASSIFICATION OF DEFECTS

- 14.01 Indication of signal governing movements from siding to main track with the current of traffic on track signaled for movements in only one direction through spring switch in automatic block-signal territory, less restrictive than "Proceed at Restricted Speed" when the block, into which movements are governed by the signal, is occupied.
- 14.02 Indication of signal governing movements from siding to main track with the current of traffic on track signaled for movements in only one direction through spring switch in automatic block signal territory, not "Stop" when main track is occupied by a train approaching switch within at least 1500 feet in approach of the approach signal for the main track signal governing trailing movements over switch.
- 14.03 Indication of signal governing movements against the current of traffic from the reverse main of main tracks to single track through spring switch in automatic block signal territory, less restrictive than "Proceed at Restricted Speed" when the block, into which movements are governed by the signal, is occupied by a preceding train.
- 14.04 Indication of signal governing movements from siding to main track signaled for movements in either direction, through spring switch in automatic block signal territory, less restrictive than "Proceed at Restricted Speed" when the block, into which movements are governed by the signal, is occupied by a preceding train.
- 14.05 Indication of signal governing movements against the current of traffic from reverse main of main tracks to single track through spring switch in automatic block signal territory, not "Stop" when the block on the single track into which the signal governs is occupied by an opposing train.
- 14.06 Indication of signal governing movements from siding to main track signaled for movements in either direction through spring switch in automatic block signal territory, not "Stop" when the block on the single track into which the signal governs is occupied by an opposing train.

- 14.07 Indication of signal governing movements against the current of traffic from the reverse main of main tracks to single track through spring switch in automatic block signal territory, not "Stop" when the normal direction main track of the double track is occupied by a train approaching the switch within at least 1500 feet in approach of the approach signal for the main-track signal governing trailing movements over switch.
- 14.08 Indication of signal governing movements from siding to main track signaled for movements in either direction through spring switch in automatic block signal territory, not "Stop" when the single track signaled for movements in both directions is occupied by a train approaching the switch within at least 1500 feet in approach of the approach signal for the main-track signal governing trailing movements over the switch.
- 14.09 Indication of signal governing movements from siding to main track with the current of traffic on track signaled for movements in only one direction through spring switch in automatic block signal territory less restrictive than "Proceed at Restricted Speed" when the block into which movements are governed by the signal is occupied and approach or time locking is ineffective.
- 14.10 Indication of signal governing movements from siding to main track, with the current of traffic, on track signaled for movements in only one direction through spring switch in automatic block signal territory, not "Stop" when main track is occupied by a train approaching switch within at least 1500 feet in approach of the approach signal for the main track signal governing trailing movements over the switch and approach or time locking is ineffective.
- 236.15 Timetable instructions.
- This rule requires automatic block, traffic control, train stop, train control, and cab signal territory be designated in timetable instructions.

Application:

May be published in either timetable or special instructions in any manner carrier chooses. Interlockings are not required to be so designated.

CLASSIFICATION OF DEFECTS

- 15.01 Automatic block signal territory not designated in timetable instructions.
- 15.02 Traffic control territory not designated in timetable instructions.
- 15.03 Automatic train stop territory not designated in timetable instructions.
- 15.04 Automatic train control territory not designated in timetable instructions.
- 15.05 Automatic cab signal territory not designated in timetable instructions.
- 236.16 Electric lock, main track releasing circuit.

This rule sets forth the requirements for main track releasing circuit for electric lock on hand-operated switch.

Application:

This rule prohibits the electric lock releasing circuit on the main track from being of such length that distance or curvature of track will prevent a crew member standing at the switch from observing a train or car occupying the releasing circuit.

The rule also requires that where the electric lock releasing circuit extends into the fouling section of turnout, train shall be prevented from occupying the fouling section by pipe-connected or independently operated, electrically locked derail at the clearance point. The releasing circuit shall be considered as extending into the fouling section if it extends further than the heel of the switch points.

Section 236.16 Electric lock main track releasing circuit.

The parties agreed to the need for a new rule which will prescribe standards for a main track releasing circuit at an electrically locked hand-operated switch. The advent of new technology, such as the audio frequency overlay, has resulted in widely varied designs for such releasing circuits, and a need has developed for safety standards regarding the installation of the main track releasing circuit. The present installations on the major carriers throughout the nation have been installed within guidelines similar to the requirements of the proposed rule. Thus, the adoption of this rule will clearly not result in a significant economic impact.

CLASSIFICATION OF DEFECTS

- 16.01 Length of electric lock releasing circuit on main track too long to permit crew member standing at the switch to see a train or car occupying the releasing circuit.
- 16.02 Curvature of track on which electric lock releasing circuit is provided prevents crew member standing at the switch from seeing a train or car occupying the releasing circuit.
- 16.03 Electric lock releasing circuit on main track extends into fouling circuit where the turnout is not equipped with a derail at the clearance point either pipe-connected to the switch or independently locked, electrically.

236.17 Pipe for operating connections; requirements.

This rule prescribes steel or wrought-iron pipe one inch or larger for operating connections of pipe-connected appliances, with each joint fully screwed into coupling with each end of pipe secured by two rivets. Pipe shall be supported on carriers not more than 8 feet apart on tangent and curves of less than 2° and not more than 7 feet apart on curves of more than 2°. Pipeline shall be properly alined and compensated and couplings shall not foul carriers. Up-and-down rods of mechanically operated signals may be three-fourths inch pipe or solid rod.

Application:

Steel or wrought-iron pipe prescribed by this rule is one-inch nominal inside diameter pipe, or 1.315 inch actual outside diameter pipe. Three-fourths inch pipe measures 1.05 inch actual outside diameter.

Pipelines should be operated and carefully observed for bowing when pipe is under compression. The complete obstruction of any device shall not permit sufficient bowing to permit latching of lever or full drive of power-operated machine.

Carriers must be complete and properly assembled and spacing strictly adhered to. Pipeline must be kept in proper alinement and carrier foundations must be secure and permit no movement when pipeline is operated. Bent or damaged pipe is prohibited.

RULE 313

The Burlington requests that the first sentence of this rule be clarified. It reads as follows:

Steel or wrought-iron pipe one inch or larger, or members of equal strength shall be used for operating connections for each switch, derail, movable-point frog, facing-point lock, rail-locking device of movable bridge protected by interlocking, and mechanically operated signal, except up-and-down rod which may be three-fourths inch pipe or solid rod.

In some instances two switches, or a combination of one switch and one derail, or two facing-point locks are in combination and operated from one pipe, and the Burlington is apprehensive that the word "each" in the first sentence might be interpreted to prohibit such combinations.

The rule as worded was not intended to prohibit such combinations from being operated from one pipeline, and to clarify this point the sentence has been reworded as follows:

Steel or wrought-iron pipe 1 inch or larger, or members of equal strength shall be used for operating connections for switches, derails, movable-point frogs, facing-point locks, rail-locking devices of movable bridge protected by interlocking, and mechanically operated signals, except up-and-down rod which may be three-fourths inch pipe or solid rod.

NPRM
Federal Register
March 21, 1983

Section 236.17 Pipe for operating connections, requirement.

Proposed section 236.17 is not a new rule but was adopted in 1950 and followed closely the requirements of its predecessor which was included in the 1939 rules. The present rule, section 236.313, applies only to interlockings.

The parties have proposed that this rule apply to all systems so that all such pipe-connected switches, derails facing point locks and other pipe-connected appurtenances will be covered with equal consistency. Therefore, the FRA proposes to move the requirements to Subpart A by recaptioning 236.313 as section 236.17.

- 17.01 Operating connection for switch, derail, movable-point frog, facing-point lock, rail-locking device of movable bridge protected by interlocking or mechanically operated signal not made of steel or wrought-iron pipe one inch or larger, or member of equal strength. (Does not apply to up-and-down rod of mechanically operated signal.)
- 17.02 Pipe not fully screwed into coupling.
- 17.03 Pipe not riveted to pipe plug with 2 rivets.
- 17.04 Pipe line out of alignment sufficiently to interfere with proper operation.
- 17.05 Pipe line not properly compensated for temperature changes.
- 17.06 Pipe line carriers spaced more than 8 feet apart on tangent or on curve of less than 2 degrees.
- 17.07 Pipe line carriers spaced more than 7 feet apart on curve of 2 degrees or more.
- 17.08 Coupling in pipe line fouls carrier.

ROADWAY SIGNALS AND CAB SIGNALS

236.21 Location of roadway signals.

This rule requires that roadway signal be positioned and aligned so that it is clearly associated with track it governs.

Application:

This rule requires that each signal be positioned and aligned so that it is clearly associated with the track it governs.

Inspectors must be alert for installation where it is possible to mistake the indication of one signal for that of another.

The FRA relies heavily on the inspector's judgment whether the location and alignment of a signal complies with the intent of this rule.

PART 236 - INSTALLATION, INSPECTION, MAINTENANCE, AND REPAIR OF SYSTEMS,
DEVICES, AND APPLIANCES.

Standards and Instructions for Signal Systems

On pages 2412 and 2413 of the Federal Register of February 3, 1970, there was published a notice of proposed rule making to amend § 236.21 by removing the present requirement that roadway signals be located over or to the right of the tracks they govern and requiring instead that signals merely be positioned and aligned so that they are clearly associated with the tracks they govern and provide a maximum unobstructed preview to approaching trains. A number of comments were received supporting or opposing the proposed rule.

On April 17, 1970, pursuant to a delegation of authority from the Federal Railroad Administration dated March 31, 1970, Examiner Boyd issued a decision and order which would have amended § 236.21 effective May 18, 1970, to read as follows:

"Each roadway signal shall be located so that it can be readily associated with the track on which it governs movements."

On May 1, 1970, pursuant to a delegation of authority from Federal Railroad Administrator dated March 31, 1970, the Railroad Safety Board stayed Examiner Boyd's decision and order. Consequently, it did not become effective and was not published as a final rule in the Federal Register.

The Brotherhood of Railroad Signalmen timely filed a petition for reconsideration of Examiner Boyd's decision and order. It submits that if § 236.21 is to be revised, the revised rule should contain the following additional requirements:

"Signals governing movements in the same direction on adjacent tracks at the same location shall have red-light-out protection provided to prevent display of a clear signal on one track with a red-light-out on the other."

After considering the record in this proceeding including the petition for reconsideration filed by the Brotherhood of Railroad Signalmen, the Board finds that, except as set forth below the findings of the Examiner are proper and correct in all material respects and hereby adopts them.

The Board further finds that safety of operation does not require roadway signals to be placed only to the right or above the tracks governed in single-track territory but that, to prevent confusion and assure safety of operation, roadway signals should continue to be placed only to the right or above the tracks governed in other than single-track territory. Relief from this requirement may be granted pursuant to § 236.16 upon adequate showing by an individual carrier.

With respect to the proposal contained in the petition for reconsideration filed by the Brotherhood of Railroad Signalmen that red-light-out protection also be required to prevent display of a clear signal on one track when a red-light-is-out of commission on an adjacent track at the same location, the Board finds this provision is not necessary to assure safety since the final rule will only allow the installation of left-hand signals in single-track territory.

In consideration of the foregoing § 236.21 is hereby amended, effective July 1, 1970 to read as follows:

§ 236.21 Location of roadway signals.

Each roadway signal must be (a) petitioned and aligned so that the indication it displays can be clearly associated with the track it governs and (b) located over or to the right of the track it governs in other than single track territory.

Section 236.21 Location of roadway signals.

The 1939 rule, section 136.2(b)(1), required that signals be aligned to give the best possible indication for approaching trains and that, "signals shall be installed to avoid, so far as possible, the liability of mistaking the indication of one signal for the indication of another signal, or confusion between signal and other lights." The rule adopted in 1950 (then 136.21) required: "Each roadway signal hereafter installed shall be located over or to the right of the track it governs." The rule was effective October 1, 1950 and remained unchanged until 1970.

On June 11, 1970 the FRA considered proposed changes to this rule to relieve what the carriers felt was an unnecessary burden. The FRA found that the safety of train operation did not require roadway signals to be placed only to the right or above the track governed on single-track territory, but to prevent confusion and assure safety of operation in multiple track territory, the roadway signals should be placed over or to the right of the track governed in other than single track territory. The FRA also added language to require that each roadway signal shall be properly positioned and aligned so that the indication it displays can be clearly associated with the track it governs, 35 FR 9926 (1970). It is felt that a requirement to mandate that roadway signals be located to the right of the track governed is unnecessary. The record shows that the present rule is still regarded by the carriers as too restrictive. A great many applications for relief from this rule have been filed with the FRA and almost without exception, each request for relief has been approved. The FRA proposes to delete the provision of the rule requiring that a roadway signal be located over or to the right of the track governed. However, the carriers are here put on notice the FRA will depend heavily on its inspectors' judgment whether the location and alignment of a signal complies with the intent of this section and that the signal aspect is clearly associated with the track governed.

CLASSIFICATION OF DEFECTS

21.01 Roadway signal not positioned and aligned so that the indication it displays can be clearly associated with the track it governs.

236.22 Semaphore signal arm; clearance to other objects.

This rule requires one-half inch clearance between a semaphore arm and any object which may interfere with its operation.

Application:

Operational test of semaphore signal should be made to insure any object, including light unit, clears arm, and spectacle at least one-half inch throughout its arc of travel.

CLASSIFICATION OF DEFECTS

22.01 Semaphore arm clears object that may interfere with its operation less than one-half inch.

236.23 Aspects and indications.

This rule prescribes how aspects shall be shown, that each aspect shall be named and indicate action to be taken and the fundamental indications of the aspects.

It provides that signals may be qualified and prohibits the use of reflector lenses or buttons or other devices depending upon reflected light for visibility in lieu of signal aspects. It prescribes that the names, indications, and aspects be defined in the carrier's operating rule books or special instructions on file with the FRA.

Application:

Applies to all system. Each aspect and indication is required to be defined in carrier's rule book or special instructions.

Use of single white light is prohibited except for indicators of protective devices such as hotbox or dragging equipment detectors or use of qualifying appurtenance.

It is permissible for carrier's to qualify red aspect to permit its use to indicate "Proceed at Restricted Speed" without requiring stop (see Rule 236.204). Yellow or lunar aspect must be used to approach such signals.

The absence of a semaphore arm on a semaphore signal is an imperfectly displayed signal and does not meet these requirements.

Fixed signal aspects, without lights or which depend for visibility upon a reflected light from an external source, is in violation of this part for night train operation.

The rule prohibits future installation of reflective devices in lieu of signal aspects such as the yellow triangle that will permit a higher speed when certain aspects are displayed.

The failure of a lamp in a light signal, a false restrictive position of a semaphore arm or the absence of a qualifying appurtenance shall not cause a signal to display a more favorable aspect than intended.

Rule 23

The Great Northern is the only railroad objecting to this rule. It takes exception to that part of the rule which reads: "A single white light shall not be used" and to that part prescribing fundamental indications which reads:

A yellow light, a lunar light, or a series of lights or a semaphore blade in the upper or lower quadrant at an angle of approximately 45 degrees to the vertical, shall be used to indicate that speed is to be restricted and stop may be required.

A single white light has been used for years by the Great Northern as an indication that a dragging equipment detector has been actuated and requires that a stop be made as promptly as the safety of the train will permit and the train examined for dragging equipment. A lunar light also has been used by it as an indication on a spring switch indicator to designate "a spring switch with facing-point lock in proper operating condition."

The reasons for barring the use of a single white light to give an indication are that a broken colored signal lens will permit a white light instead of a colored light to be displayed, and to avoid confusion that might result from other white lights along the right of way.

The lunar light was included in the paragraph describing the lights and positions of lights or semaphore arms that should be used to indicate "that speed is to be restricted and stop may be required" because there are carriers that use that light for such an indication. If the rule were revised to eliminate the words "a lunar light" as requested by the Great Northern, the use made of the lunar light on these other carriers would be restricted.

For these reasons it is not desirable to revise the rule. However, from the standpoint of safety, there appears to be no objection to the use that the Great Northern is making of the single white light or of the lunar light. There may be other carriers that make similar use of these lights. Each such case should be considered on its own merits. The note to the rule will be made to apply to the entire rule by eliminating the words "with respect to fundamental indications as applied to semaphore signals."

Section 236.23 Aspects and indications.

The 1939 rules provided as follows: "Signal indications shall be given by positions, by colored lights, or by both. A single white light shall not be used for a proceed indication."

The existing rule, adopted in 1950, is more detailed and provides a desirable standardization of signal aspects for the nation's railroads. The only carrier then objecting to the adoption of this rule was the Great Northern who used a white light for a signal aspect. Section 236.23 was adopted in its present form on July 19, 1950 and made effective October 1, 1950.

The present rule is well written and has served the industry well, but the parties to this proceeding agree that certain changes need to be made. Accordingly, the FRA proposes to revise paragraph (b) to permit the use of illuminated numerals as cab signal aspects.

The FRA proposes to revise paragraph (e) of this section for clarity with no change in the intent of the rule that a carrier shall furnish its employees and the FRA a copy of its current rules regarding signal names, aspects and indications. That portion of the rule which indicates approval by the FRA is deleted because the FRA's primary function is to review those rules for compliance with applicable FRA rules or regulations.

In addition the FRA proposes to delete existing section 236.25 and add those provisions to this section along with new requirements that the absence of a qualifying appurtenance shall not cause a signal to display a less restrictive aspect than intended. The FRA proposes to add these provisions in a new paragraph, (f), of this section.

It should be clearly understood that the FRA does not intend hereafter to permit the use of night aspects which depend upon external light for illumination in lieu of those fundamental indications prescribed in paragraph (d) of this section.

Section 236.23 - Aspects and indications.

FRA proposed to revise this section to more clearly prohibit the use of reflective devices in lieu of lights for night aspects, permit the use of illuminated numbers in cab signals, and combine the requirements of section 236.25 as paragraph (f) of this section.

The only comment regarding this section recommended that the term "qualifying appurtenance" be defined to explain how these appurtenances may be identified.

This section requires that all aspects be shown by position of semaphore blades, color of lights, position of lights, flashing of lights, or any combination thereof. The second sentence of paragraph (a) clearly identifies what qualifying appurtenances may be used in conjunction with those aspects. Since the qualifying appurtenances set forth are well recognized in the industry, FRA does not believe there is a need to further define them. Accordingly, this section has been adopted as proposed.

CLASSIFICATION OF DEFECTS

- 23.01 Aspects of roadway signal shown by means other than position of semaphore blade, color of lights, position of lights, flashing of lights, or combination thereof.
- 23.02 Single white light used for aspect of roadway signal.
- 23.03 Reflector lenses, buttons, or other devices which depend for visibility upon reflected light from an external source used in night aspect of roadway signal.
- 23.04 Aspects of cab signals shown by means other than lights, illuminated letters or illuminated numbers.
- 23.05 Signal aspect not identified by a name.
- 23.06 Signal aspect does not indicate action to be taken.
- 23.07 More than one name and indication applies to aspects indicating the same action to be taken.
- 23.08 Same aspect used with more than one name and indication.
- 23.09 Aspect other than a red light, a series of horizontal lights or a semaphore blade in the horizontal position, used to indicate stop.
- 23.10 Aspect other than a yellow light, a lunar light, a series of lights, or a semaphore blade in the upper or lower quadrant at an angle of approximately 45 degrees to the vertical, used to indicate that speed is to be restricted and stop may be required.
- 23.11 Aspect other than a green light, a series of vertical lights, or a semaphore blade in a vertical position in the upper or 60° or 90° in the lower quadrant, used to indicate proceed at authorized speed.

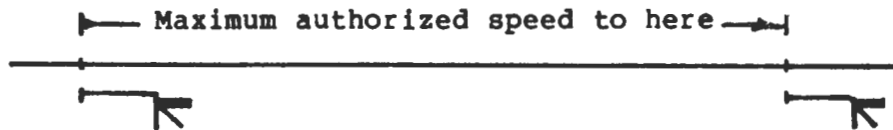
- 23.12 Names, indications and aspects of roadway signals and/or cab signals not defined in carrier's block-signal and interlocking rules currently in effect.
- 23.13 Copy of modification of carrier's block-signal and interlocking rules not filed with the Federal Railroad Administration within thirty days after such modification became effective.
- 23.14 Night aspects of roadway signals not shown by lights.
- 23.15 Signal displays a less restrictive aspect than intended when arm of semaphore signal assumes a false restrictive position.
- 23.16 Signal displays a less restrictive aspect than intended when a lamp fails in a light signal.
- 23.17 Signal displays a less restrictive aspect than intended when a qualifying appurtenance is missing from its normal location on the signal mast.
- 236.24 Spacing of roadway signals.

This rule requires signals to be adequately spaced to provide proper distances for reducing speeds or stopping by use of other than an emergency brake application before reaching the point where reduced speed or stopping is required.

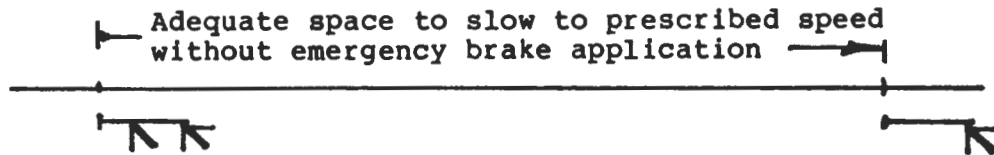
Application:

Carrier's braking distance charts shall be used to determine proper spacing. In event a carrier does not have a braking distance chart, braking tests may be required at suspected locations.

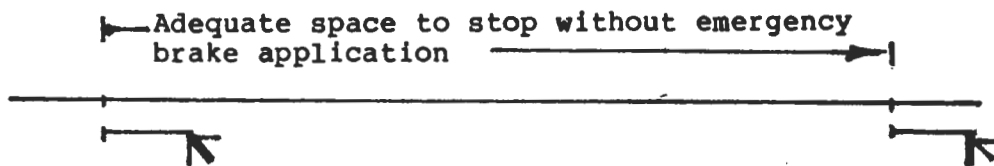
A proceed aspect authorizes maximum authorized speed to next signal without regard of preview of next signal:



A reduced speed aspect requires spacing adequate to slow to prescribed speed before reaching next signal:



An aspect requiring stop at next signal, whether operative or inoperative, requires spacing adequate to stop without emergency brake application before reaching next signal:



These requirements apply to other protective devices such as slide protection, high water protection, movable bridges, spring switches, etc.

Where speed is increased, profiles and circuit plans should be reviewed for proper braking distances.

Where yellow or lunar aspect does not provide adequate stopping distance to stop aspect, an advance approach or successive restrictive signals are necessary.

Ex Parte 171
Served June 29, 1950

Rule 24

The Great Northern objects to this rule in the belief that it prohibits the use of successive restrictive signals, which are permitted under present rule 205. Rule 24 clearly permits the use of successive restrictive signals and no change therein is warranted or necessary.

CLASSIFICATION OF DEFECTS

- 24.01 Roadway signal not located with respect to the next signal or signals in advance which governs train movements in the same direction, so that when it displays a restrictive aspect the indication of that aspect can be complied with by means of a brake application other than an emergency application initiated at such signal, by stopping at the signal where a stop is required.
- 24.02 Roadway signal not located with respect to the next signal in advance governing movements in the same direction, so that when it displays a restrictive aspect the indication of that aspect can be complied with by means of a brake application, other than an emergency application, initiated at such signal, by a reduction in speed to the rate prescribed by the next signal in advance.
- 236.26 Buffing device, maintenance.

This rule requires that buffing device be so maintained that it cannot cause a signal to display a less restrictive aspect than intended.

Application:

Operational test should be made to observe that oil or air buffers operate properly.

In the event the buffing device causes a signal to display a less restrictive aspect than intended a false proceed report shall be filed with the FRA.

CLASSIFICATION OF DEFECTS

- 26.01 Buffing device causes signal to display a less restrictive aspect than intended.

TRACK CIRCUITS

236.51 Track circuit requirements.

This rule is the standard by which all track circuits which control home signals or locking circuits shall be designed and installed. This rule does not apply to circuits such as approach lighting circuits on nonsignaled sidings or annunciator circuits.

Application:

Applies to all types of track circuits which control home signals or locking circuits. Does not apply to track circuits that do not affect safety of train operation such as annunciator circuits.

Automatic train stop, train control, and cab signal systems track circuits required to be deenergized under this rule include those superimposed on track circuits of the conjunctive system.

Maximum authorized speed through a turnout equipped with shunt fouling circuit is 45 mph. Exception should not be taken to series or parallel type track circuits where a small section of the turnout is provided with a shunt fouling circuit.

Track relay shall be deenergized or device that functions as a track relay shall be in its most restrictive state when a rail is broken or a rail or switch frog is removed; when any part of the track circuit or fouling section is occupied by a train, locomotive or car; and, where switch shunting circuit is used, when switch is not in proper position, facing point lock is not locked, or independently operated derail is not in derailing position.

It is not a violation if the track relay is not deenergized or the device that functions as a track relay is not in its most restrictive state when a rail is broken or removed in a shunt fouling circuit; when a break occurs between the end of a rail and track circuit connector, within the limits of a rail-joint bond appliance, or other protective device; as a result of leakage

current or foreign current in the rear of a point where a break occurs; or as a result of sand, rust, dirt, grease or foreign matter preventing shunting.

Where sand, rust, dirt, grease, or other foreign matter is known to prevent or possibly prevent effective shunting, the carrier is required to take adequate measures to safeguard safety of train operation.

Track relay must be in deenergized position or device that functions as a track relay must be in its most restrictive state when a rail is removed.

Non-shunting sections caused by insulated rail joint stagger on short track circuits and in connection with crossing frogs are one of the most overlooked variances with this rule. Staggered insulated rail joints in excess of five (5) feet create the possibility of cars or locomotives occupying part of a track circuit undetected.

RULE 136.51

The rules prescribed in 1939 contained nothing closely resembling the 1950 rules but it is contended on this record that the following rules, adopted in 1939, are the predecessors to the 1950 prescribed rule 136.51:

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8. In case of failure or damage to apparatus which cannot be repaired immediately and which may affect safety of train operation, signals or other controlling devices shall be arranged to provide protection until the condition is corrected.
9. In case broken rail, wide gage or other condition is discovered which may affect safety of train operation, steps shall be taken immediately to protect trains by flag, signals, or other controlling devices; record of the defect shall be made and the defect remedied as quickly as possible.

Track Circuits.

51. Track circuits shall, so far as possible, be so installed and maintained that the track relay will 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 will be deenergized in the rear of the point where any of the following conditions exist:

- (a) A rail is broken or a rail or frog is removed.
- (b) A train, engine, or car occupies any part of a track section including fouling section of turnout or crossover.
- (c) Where switch shunting circuit is used--
 1. A switch is misplaced or its points not in proper position.
 2. A switch is not properly locked where facing point lock with circuit controller is used.

3. An independently operated fouling point derail equipped with switch circuit controller is misplaced or not in derailing position.

As indicated these rules were not continued in the same phraseology and form after 1950. The following shows the 1950 rule, and to the side with proposed changes underlined, is the part of that rule here under consideration:

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 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 miles per hour. It shall not be a violation of this requirement if a track circuit is energized when a break occurs within the limits of the joint bars or rail-joint bond, or as a result of leakage current or foreign current in the rear of a point where a break occurs or a rail is removed.

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 provide a bypath for the electric current, or
(2) As result of leakage current or foreign current in the rear of a point where a break occurs or a rail is removed.

(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.

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

Insofar as here pertinent, and stated simply without the numerous exceptions, the present rule requires that track relay shall be in deenergized position, thus causing a restrictive signal, whenever a rail is broken or a rail or switch frog is removed. The trouble with this rule as it is presently worded, is that it overlooks the common place existence of a tie plate under each rail, and the tie plate being a conductor of electricity and a bypath for the current would keep the track relay in energized position in violation of the rule. Other connecting and strengthening devices are also frequently used as indicated above. Yet a tie plate or any other connecting and rail strengthening device is an obviously desirable and necessary appliance.

It is pointed out that in another proceeding before this Commission evidence was introduced showing that in the case of a 39-foot rail with 37 ties to the rail-length and using joint bars 2 feet, 4 inches long, broken rail protection is provided for only 38 per cent of the rail. Guard rails at switches and frogs being bolted to the main-track rails also provide bypaths 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 bypaths around a break in the main track rail. It is proposed the considered 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 bypassed by some appliance or protective device that is essential for the safe and efficient movement of trains. It was never intended by the present rule that violations exist under these circumstances and in fact no railroad in the nation has yet complied with the literal meaning of the present rule. Moreover, the Bureau has taken the position that it is impossible for the present rule to be literally complied with and, again, much of its motivation for the proposed change is to affirmatively approve what has been passively approved ever since the rule was prescribed. The intent and purpose behind the rule would not be changed under the considered proposal.

The RLEA objects to the proposed changes in this rule more because of the direction the changes take, rather than because of specific changes in conditions which would occur. It does not meet the fact that the railroads of the nation already accept the rule only as it is here proposed, and that this general industry-wide violation has long had the Bureau's informal approval. Rather the RLEA insists that when a rail is broken, anywhere,

something should be done immediately to correct it and, at the least, a signal displaying stop should be displayed. While the RLEA recognizes that the normal devices such as tie plates, rail joint bars, and guard rails should be excepted by the rule, that a break in these areas will not always affect the track circuit and cause a restrictive signal, and that trainmen and operating people are well aware that they are getting less-than-complete-broken-rail protection, they, nevertheless insist that the Commission should work in the direction of maximum broken rail protection rather than toward less as they see it here. Affirmatively, they suggest that the Commission might spell out more specifically how the excepting devices mentioned in the rule should be installed. For example, rail joint bond may be applied an excessive length from the end of the joint bar; also welded bond is cited as a type of bond offering maximum broken rail protection. The prevention of excessive distances in the installation of the protective appliances involved in this rule is the primary concern of the RLEA in this area. They would require a three inch limitation and restrict the appliances to named ones, namely, tie plates, rail joint bonds, guard rails at frogs, and rail braces at switches, rather than generalize the rule by the proposed broad phrase "appliance or other protective device". While recognizing some measure of non-broken rail protection resulting from the tie plates and other devices here mentioned, they urge not only the prescription of minimum distances and specific methods of application of the devices but also the promulgation of a rule, jurisdiction aside, similar to the following:

When broken rail, or other condition which may affect safety of train operation is discovered, steps shall be taken immediately to afford flag protection, and signals shall be secured to display their most restrictive indication. Notify track foreman and signal supervisor or signal foreman. The defect must be corrected as quickly as possible and report made promptly.

The protestants further urge that something be included in the signal rules to require the exclusion and elimination of any foreign matter such as sand and rust, which may prevent the shunting of the track circuit from the signal system and from the rails. Specifically, the protestants urge the adoption of the following rule changes underlined, instead of the one set forth above:

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 miles per hour.

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 three inches of the end of the angle car, 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.

In response to the evidence and arguments advanced by the RLEA on this rule, the AAR emphasizes that the first ingredient of safety in the movement of railroad trains is an adequate road bed and track structure, and that no signal system could exceed in importance the underlying features in the roadway itself; that such appliances as the plates, guard rails, rail braces, slide plates, frogs, filler blocks, and other similar appliances and devices are absolutely essential to the security, stability, strength and safety of the track over which trains move; and that a proper approach to this matter requires first a clear recognition that the signal system must be compatible with the underlying requirements of the roadway and track facilities. The basic position of the AAR on track defects is that (1) carriers already have rules, by whatever name, which require in effect, that a broken rail or other defect must be reported to all appropriate and

responsible personnel immediately and that appropriate flagging and other warning actions also be taken immediately, and (2) that signalmen need not be called to duty because of track defects as certain operating and maintenance of way rules governing concerned employees adequately take care of all safety problems stemming from the track defect. Track defects are usually found by sectionmen, track supervisors, roadmasters, and other employees traveling on track motor cars and they take immediate steps, without awaiting the arrival of a signalman, to protect train movements. Numerous operating rules are in effect to this end. However, signalmen, if present are usually required to take protective action. For example, a rule addressed to signal maintainers now in effect on the Illinois Central Railroad Company reads as follows:

Rule 417 "Unsafe Track. If track is found to be unsafe for trains due to broken rail or other cause signals must be secured to display their most restrictive indication and immediate steps taken to protect trains by flag. If a switch is found to be in an unsafe operating condition it must be spiked in a safe position and the section foreman, dispatcher and supervisor of signals notified at once."

The AAR insists, in summation on this facet of the problems in issue, that the Interstate Commerce Commission not only lacks jurisdiction to enunciate a rule or rules akin or similar to carrier operating rules but that, in addition, there is absolutely no need to augment the protection against track defects already afforded in abundant measure by numerous carrier-promulgated and carrier-enforced rules.

In respect to the three-inch-distance limitation counter-proposed by the RLEA, the AAR, supported by the Bureau, strongly insists that such a limitation would be impracticable and unduly expensive.

In respect to the loss of shunt problem, the Bureau in its brief filed October 17, 1963, raises a new thought and suggests that it might be appropriate to restrict the proposed exception in 136.51(b) by changing the last sentence thereof to read:

**** It shall not be a violation of this requirement where the presence of sand, rust, dirt, grease or other foreign matter prevents effective shunting, except that where such conditions are known to exist adequate measures for insuring safety of train operation must be taken.

In suggesting this change the Bureau states:

While it is true that loss of shunt due to any sort of deposit on the rails can create a very dangerous condition, often such deposits are wholly beyond the carrier's

control. Thus it is appropriate as a practical matter to provide some relief from section 136.51 when such conditions occur. However recently the Commission had brought to its attention two serious accidents which resulted from loss of shunt due to grease and rust. In each instance the condition was apparently known to the railroad involved. Yet, necessary measures to assure safety of train operation were not taken. The intent of the exception to section 136.51(b) was never to permit such known dangerous conditions to exist. Therefore it may be appropriate at this time to restrict the exception in 136.51(b) to those conditions not known to the carrier ***.

The RLEA is on the side of the Bureau in the suggested change but the AAR objects to it and on November 5, 1963, the AAR filed a motion to strike on the ground that it raises new matter not presented at the hearing, not conveyed in any form to the AAR, and on which the AAR has not had its day in court, all allegedly in contravention of the Fifth Amendment to the Constitution and in violation of the Administrative Procedure Act.

The motion to strike may ordinarily be well taken but in this type of proceeding new thoughts and new evidence bearing directly on the issue of safety, as do the accident reports referred to, of which we may take judicial notice, are not to be shut out at anytime regardless of the stage in which the proceeding is currently in process. Therefore, the motion to strike, be, and it is hereby, denied. This does not mean, however, that the rule shall be finally changed along the suggested new line without giving the AAR an opportunity to be heard. On the contrary, should the Examiner tentatively adopt the recent suggestion the AAR need only except to it, and ask for a hearing on that issue.

Discussion and Findings Rule 136.51. It is generally agreed that Part (a) of this rule should be revised to except "normal devices" including tieplates, rail joint bars, guard rails, and other named devices. The real problems in issue on this part of the rule are (1) whether only named devices should be excepted, rather than all protective devices, and (2) whether the manner of application of these devices should be prescribed so as to prevent abuses, as suggested by the RLEA. As seen the latter point is certainly deserving of further scrutiny if, in fact, the nation's railroads are guilty of abusing the latitude given them in this respect; however, this record does not so indict them, and on the contrary it appears not to have been a noteworthy problem until now. The industry is admonished, nevertheless, that the suggestion of the RLEA in this connection may at any time be renewed or reconsidered on the Commission's own motion. The issue of specific devices, rather than a general term covering them all as suggested by the Bureau, appears to solve itself by the mere fact that other

¹ ATSF at Syracuse, Kansas, July 6, 1962, accident report No. 3957, and PRR-PATH at Harrison, N.J., July 24, 1963, accident report No. 4002.

and improved devices may come into use constantly, as a matter of routine engineering progress, and the overall provisions of the rule, taken in proper context, make clear the intent and purpose of the rule so that no problem is posed by the use of the broader term.

The other affirmative suggestions of the RLEA are noted, in particular its suggestion for a provision here similar to rule 417 on the Illinois Central. But again the record is lacking in evidence respecting the inclusion of such a rule in 1939 and the exclusion of it in 1950. Since it was most pointedly taken out in 1950, something more than we have here would be necessary before it should be reinserted.

On the question of loss of shunt due to rusty rails or deposits of sand, grease, or dirt on the rails, the 1939 rules contained nothing excusing the deenergizing requirement merely because of rust or other foreign matter on the rail. However, in 1950 it was specifically provided that failure to shunt because of rusty rail or other foreign matter would not constitute a violation. The question now is should a carrier be excused in this respect if it knows the rust or foreign matter on its rails is such as to prevent shunting and thus, in turn, prevent track occupancy from being reflected in its signal system. As seen, the answer is obviously no. The fact that the problem may be difficult, is no reason why it should be avoided here, and in any event, the recent suggestion of the Bureau does not come into play until the condition is known to exist. In the Examiner's opinion the Bureau does not go far enough on this, much less too far as urged by the AAR.

In summation on this rule, the Examiner finds that in the public interest and in the interest of safety this rule should be revised as proposed herein at the time of the hearing and that in addition the last sentence of part (b) should be changed to read as suggested by the Bureau in its brief, provided however, that any party desiring to be heard on the change suggested in the Bureau's brief is entitled to be heard thereon and that a petition seeking such a hearing filed within the usual period should be granted and also should stay the execution of said finding.

Rule 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 miles per hour. It shall not be a violation of this requirement if a track circuit is energized: ~~When a break occurs within the limits of the joint-bars or rail-bond; or as a result of leakage current or foreign current in the rear of a point where a break occurs or a rail is removed.~~

(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 bypath for the electric current, or
(2) As result of leakage current or foreign current 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 derailing position.

In general, the present rule requires that track relay shall be in the deenergized position, thus causing a signal to display its most restrictive aspect, whenever a rail is broken or a rail or switch frog is removed. The present rule does not specifically deal with all of the numerous by-paths for the track current, such as tie plates, guard rails, rail braces and rail joint bonds, which keep the relay in an energized position even though a section of track rail is broken. RLEA objects to the proposed change because it insists that when a rail is broken, at any point, corrective action should be taken immediately and a signal indicating a stop aspect should be delayed. They suggest that the Commission might spell out more specifically how the devices mentioned in the exception to the proposed rule should be installed. As previously indicated, the Commission's jurisdiction over track rails is limited to rails or portions thereof which serve as components of a signal system. When a track break occurs at one of the places enumerated in rule 51(a)(1), the involved section of track is not a component of a signal system and not within the Commission's jurisdiction.

RLEA's principal position respecting rule 51 is reflected in their proposed rule requiring that:

When broken rail, wide gauge, 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.

AAR states that this proposal would require the calling of an army of signalmen to position signals manually if any of the various stated conditions prevailed; that track may be "obstructed" by any of a thousand causes ranging from varieties of malicious mischief to a drift of snow, none of which are capable of being detected by the signal system.

AAR insists that the Interstate Commerce Commission not only lacks jurisdiction to enunciate a rule or rules similar to carrier operating rules but that, in addition, there is absolutely no need to augment the protection against track defects already afforded by numerous carrier-promulgated and carrier-enforced rules. We agree with the position of the AAR that the steps to be taken after dangerous conditions are found to exist and before permanent repairs are made, are matters best left to the carriers.

Subsection (b) of rule 51 concerning effective shunting is a matter which has caused a great deal of difficulty. In its brief filed October 17, 1963, the Bureau suggested that it might be appropriate to restrict the proposed exception in rule 51(b) by changing the last sentence to read:

*** It shall not be a violation of this requirement where the presence of sand, rust, dirt, grease, or other foreign matter prevents effective shunting, except that where such conditions are known to exist adequate measures for insuring safety of train operation must be taken.

In suggesting this change the Bureau stated:

While it is true that loss of shunt due to any sort of deposit on the rails can create a very dangerous condition, often such deposits are wholly beyond the carrier's control. Thus it is appropriate as a practical matter to provide some relief from section 136.51 when such conditions occur. However recently the Commission had brought to its attention two serious accidents which resulted from loss of shunt due to grease and rust. In each instance the condition was apparently known to the railroad involved. Yet, necessary measures to assure safety of train operation were not taken. The intent of the exception to section 136.51(b) was never to permit such known dangerous conditions to exist. Therefore it may be appropriate at this time to restrict the exception in 136.51(b) to those conditions not known to the carrier***.

At the further hearing on rule 51(b), the AAR agreed with the essence of the Bureau's suggested change but with some modification in the language as follows:

*** It shall not be a violation of this requirement where the presence of sand, rust, dirt, grease, or other foreign matters prevents effective shunting, except that where such conditions are known to exist adequate measures to safeguard train operation must be taken.

The rule does not spell out any specific action to be taken by the carrier and thus leaves to the carrier's judgment the precise steps required to provide the needed protection. RLEA does not specifically object to the change agreed upon at the further hearing but continues to urge adoption of its principal proposal.

We conclude that the proposed rule, with the change agreed upon at the further hearing, will not impair safety and is a reasonable solution to an admittedly difficult operating problem.

Section 236.51 Track circuit requirements.

The present rule prescribes the standard by which all track circuits are designed. The original 1939 rules required all track circuits to be so installed and maintained that the track relay would be in deenergized position and track circuit of ACS, ATC or ATS systems be deenergized in the rear of the point of a rail that is broken or when a rail or frog is removed; when a train, engine or car occupies any part of a track section; and where switch shunting is used, when a switch point is not in proper position or switch and lock movement is not locked or an independently operated fouling point derail equipped with a switch circuit controller is not in the derailing position.

The 1950 rules provided for the same requirements and additionally imposed restrictions that shunt fouling could not be used on turnouts where speeds exceeded 45 miles per hour. The 1950 rules also adopted certain exclusions in that the provisions regarding broken rails or removal of rails do not apply to shunt fouling section or to a rail broken within the confines of a joint bar; it is not a violation if leakage of a foreign current in the rear of a broken rail or a removed rail energizes the track circuit; and it is not a violation if rust, grease or other foreign material prevents effective shunting of the track circuit.

In 1966 the rule was further relaxed to provide that rails broken within the limits of a rail joint bond, appliance or other protective device which provides a by-path for the electric current would also be exempt from the requirement that the track relay be in the deenergized position. The present rule has served well and its requirements are reasonable. However, within the last ten years, several signal systems have been developed in this country that do not have a track relay associated with the system's track circuits. Instead there is an electronic device that functions similar to a track relay. After seriously considering the matter, the FRA now feels that this is the time to realistically modify this rule so that it is clear to all concerned that the provisions of this rule

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apply equally to track circuits with track relays and track circuits which have electronic devices instead of relays. While considering the first paragraph, it is well to note the carriers have submitted that this section should not be applied to circuits such as annunciator circuit, approach lighting circuit and such circuits that do not affect the safety of train operation. The FRA proposes to modify this section to apply only to those track circuits which affect the safe movement of trains.

In order that this first paragraph be properly interpreted a definition of "most restrictive state " is proposed in the definition section, subpart G, section 236.813a.

The parties to this proceeding agree that, whenever a rail is removed, the track circuit should detect the removal of that rail regardless of circumstances. Accordingly, the FRA proposes to delete the words "or a rail is removed" from paragraph (a)(2) of this section.

CLASSIFICATION OF DEFECTS

- 51.01 Track relay not in deenergized position or device that functions as a track relay not in its most restrictive state in rear of broken rail.
- 51.02 Track relay not in deenergized position or device that functions as a track relay not in its most restrictive state when rail or switch frog is removed from track.
- 51.03 Shunt fouling circuit used where permissible speed through turnout is greater than 45 miles per hour.
- 51.04 Track relay not in deenergized position or device that functions as a track relay not in its most restrictive state when a train, locomotive, or car occupies any part of the track circuit, except fouling section of turnout of hand-operated main-track crossover. (Explain fully condition of rails with respect to presence of rust, dirt, grease or other foreign matter).
- 51.05 Adequate measures to safeguard train operation not taken when it is known that a condition of sand, rust, dirt, grease or other foreign matter exists that has prevented effective shunting of a track circuit when occupied by a train, locomotive, or car.
- 51.06 Track relay not in deenergized position or device that functions as a track relay not in its most restrictive state when switch points are not closed in normal position, where switch shunting circuit is used.
- 51.07 Track relay not in deenergized position or device that functions as a track relay not in its most restrictive state when switch is not locked where switch is equipped with facing-point lock with switch circuit controller and where switch shunting circuit is used.
- 51.08 Track relay not in deenergized position or device that functions as a track relay not in its most restrictive state when independently operated fouling-point derail equipped with switch circuit controller is not in derailing position, where switch shunting circuit is used.

- 51.09 Track circuit of an automatic train stop, train control or cab signal system not deenergized in rear of broken rail.
- 51.10 Track circuit of an automatic train stop, train control or cab signal system not deenergized when rail or switch frog is removed from track.
- 51.11 Track circuit of automatic train stop, train control or cab signal not deenergized in the rear of a train, locomotive or car when such equipment occupies any part of a track circuit, except the fouling section of turnout of hand-operated main-track crossover. (Explain fully condition of rail with respect to presence of rust, dirt, grease, or other foreign matter.)
- 51.12 Adequate measures to safeguard train operation not taken when it is known that a condition of sand, rust, dirt, grease or other foreign matter exists that has prevented effective deenergization of a track circuit of automatic train stop, train control or cab signal system in the rear of a train, locomotive or car when track circuit is occupied by such equipment.
- 51.13 Track circuit of automatic train stop, train control or cab signal system not deenergized when switch points are not closed in normal position, where switch shunting circuit is used.
- 51.14 Track circuit of automatic train stop, train control or cab signal system not deenergized when switch is not locked where switch is equipped with facing-point lock with circuit controller and where switch shunting circuit is used.
- 51.15 Track circuit of automatic train stop, train control or cab signal system not deenergized when independently operated fouling-point derail equipped with switch circuit controller is not in derailing position, where switch shunting circuit is used.

236.52 Relayed cut-section.

This rule requires that where energy of noncoded track circuit is supplied through contacts of adjoining noncoded track relay, energy circuit shall be opened and track circuit shunted when relay is deenergized.

Application:

Apply at relayed cut-section of noncoded direct-current track circuit only, including polar, neutral or biased relays.

CLASSIFICATION OF DEFECTS

52.01 Where relayed cut-section is used in territory where noncoded direct current track circuits are in use, the energy circuit to the adjoining track circuit not opened when track relay at the cut-section is in deenergized position.

52.02 Where relayed cut-section is used in territory where noncoded direct current track circuits are in use the adjoining track circuit not shunted when the track relay at the cut section is in deenergized position.

236.53 Track circuit feed at grade crossing.

At crossing-at-grade of a non-electrified railroad using noncoded direct-current track circuits with electrified railroad, this rule requires the battery end of direct-current track circuit be located at the crossing.

Application:

This rule is not applicable unless foreign current is proven to be present.

CLASSIFICATION OF DEFECTS

53.01 At grade crossing with electric railroad where foreign current is present, the electric energy for noncoded direct current track circuit feeds toward the crossing.

236.54 Minimum length of track circuit.

This rule permits the use of track circuits shorter than the inner wheelbase of any locomotive or car provided other means are used to provide the equivalent of track circuit protection.

Application:

Track circuits shorter than the inner wheelbase of any car or locomotive operating over the track are prohibited unless supplemented with other protective devices or circuits that provide protection equivalent to a track circuit.

This rule is applicable to all track circuits which control home signals or electric locking circuits. The rule does not apply to track circuits used exclusively for approach lighting circuits on sidings or auxiliary tracks or to annunciator circuits or other nonvital type track circuits.

In addition to trap circuits, directional stick circuits, and check-in check-out circuits permitted in the past, carriers may now provide devices that detect the presence of locomotives or cars if such devices are so interconnected with the signaling system that it will perform equivalent to a track circuit of proper length.

Section 236.54 Minimum length of track circuit.

This rule is virtually unchanged since 1939. In 1950 the wording was added, "or special circuit not used for control of signaling facilities." Presumably this was done to exempt such circuits as annunciator circuits.

In recent years the industry has developed several ways to detect track occupancy of short track sections without resorting to trap circuits. The FRA proposal to change this rule will recognize advances of such technology in the industry and will not preclude the use of those devices which provide protection equal to or better than a trap circuit.

CLASSIFICATION OF DEFECTS

54.01 Length of track circuit used for controlling signaling facilities that is less than maximum inner wheelbase of locomotive or car, not supplemented by special circuit or protective device that provides equivalent of full track circuit protection.

236.55 Dead section; maximum length.

This rule prohibits the use of dead section longer than the shortest outer wheel base of a carrier's locomotive but in no case longer than 35 feet without protecting it with a special circuit.

Application:

This rule applies to the outer wheelbase of locomotives only and does not apply to cars.

Trap circuits are more commonly used to protect dead sections; however, directional stick circuits fall into the category of special circuits.

Presence detector or other such devices satisfy the requirement of this part.

This rule is not applicable to non-shunting section caused by the stagger of insulated rail joints. Apply rule 51 where stagger of insulated rail joints permit cars to span a live rail of the track circuit.

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Section 236.55 Dead section; maximum length.

The 1939 rule required a special circuit if a dead section exceeded 35 feet or the length of the wheelbase of any engine or car.

The 1950 rule was modified to provide the dead section should not exceed 35 feet or the outer wheelbase of any locomotive operating over such dead section. The FRA proposes to insert the word "a" after "35 feet" at the end of the first sentence as a mere editorial change.

CLASSIFICATION OF DEFECTS

- 55.01 Dead section exceeds 35 feet and special circuit not installed.
- 55.02 Length of dead section exceeds length of outer wheelbase of locomotive operating over such dead section and special circuit not installed. (Applies where length of outer wheelbase of locomotive is less than 35 feet.)

236.56 Shunting sensitivity.

This rule requires that track circuit controlling signal aspects or electric locking shall be maintained so that where a shunt of 0.06 ohm resistance is connected across the rails of the track circuit at any location in the circuit, including shunt fouling section, the track relay shall assume the deenergized position or if an electronic device is used in lieu of a track relay, such electronic device shall assume its most restrictive state.

Application:

This requirement applies to any type track circuit of which the rails form a part of the circuit and used for controlling signal aspects or electric locking. Does not apply to approach lighting circuits on nonsignaled track, annunciator circuits, etc.

The most difficult time to shunt a track circuit is when the ballast is dry or frozen.

Car frame type track circuit must comply with this part.

Each turnout has three fouling sections which should be tested.

Most restrictive state is defined in § 236.813a as the mode of an electronic device that is equivalent to a track relay in its deenergized position. Regardless of the type of track circuit, this rule requires that signals governing movements over the track circuit must display their most restrictive aspects when the track circuit is shunted with a resistance of 0.06 ohms.

Section 236.56 Shunting sensitivity.

The 1939 rule provided that a track circuit should be energized sufficiently to properly operate in wet weather with minimum ballast resistance but would not be over-energized to the extent that it would not shunt properly during dry weather under conditions of maximum ballast resistance.

The rule was changed in 1950 to its present form which prescribes a track circuit be maintained so the track relay will be in deenergized position when a shunt of 0.06 ohm resistance is connected to the rails of the track circuit. The rule in its present form does not address the issue of track circuits having electronic devices which detect track occupancy. Such circuits have no track relay.

The FRA proposes changes to the rule's language to recognize the electronic devices and make this rule applicable to all track circuits regardless of the type of track occupancy detection device.

The carriers submit that certain track circuits, such as annunciator circuits, do not affect the safety of train operation and should be exempted from the requirements of this rule. The FRA agrees the requirements of this section should not address track circuits that do not affect safety of train operation. Accordingly, the FRA's proposed modification would cover only those track circuits that control home signals.

CLASSIFICATION OF DEFECTS

56.01 Track relay not in deenergized position or device that functions as a track relay is not in its most restrictive state with a shunt of 0.06 ohm resistance connected across rails of track circuit when track circuit is dry.

236.57 Shunting and fouling wires.

Shunt wires and fouling wires are each required to be of sufficient conductivity and maintained in such condition that the track relay will be deenergized when the track circuit is shunted. Two completely separate conductors are required, except where switch circuit controller is used to both open control circuits and shunt the track circuit.

Application:

This rule prohibits the installation of a single duplex wire with single plug as fouling or shunt wires. The single plug constitutes a single conductor. Existing installations having single duplex wires with single plug for shunt or fouling wires may be continued in use until such time as they require repair or replacement. The use of two duplex wires with single plug is acceptable.

A conductor consisting of many small strands, such as that with the trade name "Bondstrand," can be only considered as a single conductor.

Two fouling wires are required at the heel of the reverse switch point, and toe and heel of the switch frog, and between the outer rails of the track circuit and turnout.

Shunt wires to switch circuit controller shall consist of two separate conductors connected to each rail and extending to the terminals of switch circuit controller.

This rule is not applicable to rail joint bonds in fouling sections.

236.57 Shunt wires.

The 1939 rule required that, "shunt wires, preferably in duplicate, shall provide adequate conductivity to ensure effective shunting and shall be kept in place and in good condition." That rule did not refer to fouling wires and did not mandate the use of two conductors.

The revision of the rules in 1950 changed this section to its present form which requires the use of two conductors for shunt and fouling wires, except shunt wires to switch circuit controllers, through which signal control circuits are controlled and track circuits are shunted.

Interpretation of this rule has permitted the use of a single unit shunt or fouling wire having two conductors with a single plug on each end. This duplex fouling or shunt wire has the disadvantage that, if either of the two plugs were broken off the rail, a dangerous condition could possibly result. The intent of the proposed revision is clearly to preclude such a dangerous condition from occurring.

The interested parties to this proceeding agree the rule should be changed to require two separate conductors. However, a need exists to recognize the severe economic burden that would be placed on the nation's carriers if they would be immediately required to comply. The proposed revision will grandfather existing installations. The language used to make these rules applicable to electronic devices as previously discussed in section 236.51 also applies here. Further, the proposed rule will not apply to shunt wires where signal control circuits are controlled through the switch circuit controller.

Section 236.57 - Shunt and fouling wires.

FRA proposed to revise this section to prohibit future use of shunt and fouling wires having duplex conductors fastened to a single plug for connecting to the rail. This change would require shunt and fouling wires to be two individual conductors, each fastened to an individual plug for connecting to the rail. Therefore, if one plug of a shunt or fouling wire is broken, the other shunt or fouling wire will still remain intact and capable of providing the intended protection.

One commenter recommended other language to clarify the intent of proposed paragraph (a) and to clarify in paragraph (b) whether the switch shunting circuit selected through a switch circuit controller is exempt or whether the exemption addresses a series type circuit arrangement whereby the circuit controller opens the track circuit. The commenter also recommended that exemption of existing installations be limited to a finite time or event, such as, when existing duplex type shunt and fouling wires are replaced.

FRA believes the proposed language of paragraph (a) clearly requires that separate conductors will be required in future installations. The phrase "two discrete conductors" was purposely inserted in the proposed language to clarify that two separate and distinct conductors will be required throughout the shunt or fouling circuit.

When it becomes effective, the rule will prohibit the installation of only one duplex shunt or fouling wire with single plug at new or existing installations. However, existing installations of duplex shunt or fouling wires with single plugs may continue in service until there is a need to replace them.

The proposed exemption of paragraph (b) would permit the use of a single shunt wire where track or control circuit is selected through the switch circuit controller. In adopting the final rule, FRA has decided to reword paragraph (b) to more clearly indicate this meaning. This change and the clarification provided above should resolve the interpretive problem noted by the commenter.

- 57.01 Shunt or fouling wires do not consist of at least two discrete conductors. (Does not apply to shunt wires to switch circuit controller through which signal control circuits are controlled and track circuits are shunted, or where track circuit is opened and relay side of track circuit is shunted.)
- 57.02 Shunt wires not of sufficient conductivity so that track relay is in deenergized position or device that functions as track relay is in its most restrictive state when circuit is shunted.
- 57.03 Shunt wires not maintained in such condition that track relay is in deenergized position or device that functions as track relay is in its most restrictive state when circuit is shunted.
- 57.04 Fouling wires not of sufficient conductivity so that track relay is in deenergized position or device that functions as track relay is in its most restrictive state when circuit is shunted.
- 57.05 Fouling wires not maintained in such condition that track relay is in deenergized position or device that functions as track relay is in its most restrictive state when circuit is shunted.

236.58 Turnout, fouling section.

The fouling section of each turnout is required to be bonded and to extend to the clearance point.

Application:

This rule requires that the fouling section of each turnout shall extend to a point on the turnout where a standing car or engine will clear a movement on the main track under all circumstances.

This rule requires that each rail joint in the fouling section be bonded. The rule does not require double bonding of the rail joints.

Section 236.58 Turnout, fouling section.

This rule referring to fouling section specifically was adopted in 1950. It simply requires: "Fouling section of turnout shall extend to clearance point."

There are problems with this rule since the FRA does not prescribe the location of "clearance point" and there is no requirement that the fouling section be bonded. The fouling section of a turnout is part of the track circuit on the main track and as such must comply with section 236.56, which requires that all portions of the track circuit offer effective shunting. In order to assure the shunting is effective, it is the practice of the nation's carriers to bond the fouling section. The parties have agreed on an alternative to the use of the words "clearance point". The FRA has considered this recommendation, and it will be incorporated into the proposed rule.

CLASSIFICATION OF DEFECTS

- 58.01 Fouling section of turnout does not extend to clearance point.
- 58.02 Rail joint in shunt fouling section not bonded.

236.59 Insulated rail joints.

Insulated rail joints are required to be maintained in such condition to prevent energy from flowing between adjoining track circuits.

Application:

Applies to all insulated rail joints in all systems.

An insulated rail joint is considered defective when tests prove insulation is worn, deteriorated or otherwise bypassed so as to conduct sufficient current between adjoining track circuits to cause track circuit failure.

The breakdown of insulation in a single insulated rail joint is considered a failure of a track circuit even though the adjacent insulated rail joint is in good condition.

CLASSIFICATION OF DEFECTS

- 59.01 Insulated rail joint not maintained in condition to prevent flow of sufficient track circuit current between rails separated by the insulation to cause failure of the track circuit.
- 59.02 Insulated rail joint not maintained in such a condition that the track circuit through the switch circuit controller can be opened when switch point open.
- 59.99 Insulation in insulated rail joint in bad condition.

236.60 Switch shunting circuit, use restricted.

This rule prohibits the installation of switch shunting circuit except where track or control circuit is also opened through the switch circuit controller.

Application:

This rule applies to all systems including signal arrangements such as tunnel protection, slide detector or high water detector.

The rule permits the continued use of existing installations of switch shunting circuits.

Section 236.60 Shunting of track circuits.

A new rule, section 236.60, is proposed. It has long been recognized that the shunting of track circuits by a switch circuit controller attached to the switch point is not completely fail safe.

It was suggested that a new rule be adopted to prohibit the use of such track circuit shunting at switches and at other protective devices, such as slide fences.

There are presently more than 37,000 hand-operated switches in signaled territory of which at least 50% are equipped with track circuit shunting. To require the carriers to bring the existing installations into compliance with the provisions of the proposed new rule would impose a very severe economic burden on the industry. To obviate that unnecessary burden, the parties have agreed and the proposed rule so provides that the proper protection to such switches or devices would apply to track shunts installed after the effective date of the rule.

Section 236.60 - Shunting of track circuits.

FRA proposed this new section to restrict the use of switch shunting circuits that are used to protect switches and other protective devices, such as slide fences. One commenter believes that the railroads should not be allowed to continue to use those shunt type circuits for an indefinite time as allowed by the "grandfather clause" in the proposed section, but that some limiting period or event should trigger their removal or replacement.

As indicated in the preamble to the NPRM, the requirement that existing installations be brought into compliance would impose a very severe economic burden on the industry. FRA believes such an imposition would not be realistic at this time. FRA intends to monitor this particular area of signaling closely to assure that proper maintenance of switch shunting circuits will render them capable of performing as intended. Based on this information and the carriers' new standards and practices that will ultimately indicate trends in their ability to achieve compliance, FRA will address this issue in future rulemaking proceedings. Accordingly, FRA rejects the commenter's suggestion to eliminate the "grandfather clause" at this time. However, in order to more accurately describe the intent of this section, the final rule is recaptioned to read, "Switch shunting circuit; use restricted."

CLASSIFICATION OF DEFECTS

- 60.01 Switch shunting circuit installed where track circuit or control circuit not opened by switch circuit controller. (Does not apply to installations made before February 27, 1984.)

WIRES AND CABLE

- 236.71 Signal wires on pole line and aerial cable.

Signal wires carried on pole lines are required to be securely fastened to insulators. Cable used aerially is required to be supported by messenger.

Application:

The intent of this rule is that all signal wires including A.C. power supply carried on pole line are required to be tied in on insulators that are securely fastened to a crossarm or bracket attached to a pole. Signal wire is required to be maintained clear of all other wires.

Particular attention should be given to vertical runs of cable. These are frequently found tied off at the top of the run at which point the entire weight of the cable is self-supported. The cable is required to be supported throughout by messenger.

Section 236.71 Signal wires on pole line and aerial cables.

The 1939 rules required that pole lines carrying signal circuits be properly installed and maintained; that wires be properly tied in on insulators; and that broken insulators be replaced. The revisions of 1950 resulted in the present rules, sections 236.71 and 236.75.

The FRA proposes to consolidate the requirements of sections 236.71 and 236.75 into one section that would prescribe the requirements for pole lines and aerial cables carrying signal circuits. The resulting section 236.71 would more clearly define the requirements regarding pole lines and aerial cables. Existing section 236.75 would be deleted.

CLASSIFICATION OF DEFECTS

- 71.01 Signal wire carried on pole line not securely tied in on insulator.
- 71.02 Signal wire not secured because of broken, missing or burnt pole.
- 71.03 Signal wire not secured because of broken, burnt, or missing crossarm.
- 71.04 Signal wire interferes with or is interfered by another wire.
- 71.05 Cable used aerially not supported on insulators or by messenger.
- 236.73 Open-wire transmission line; clearance to other circuits.

This rule requires that open-wire transmission lines of 750 volts or more be placed at least four feet above the nearest crossarm carrying signal or communication wires.

Application:

Applies where power of 750 volts or more is transmitted by open-wire line.

CLASSIFICATION OF DEFECTS

- 73.01 Open-wire transmission line operating at voltage of 750 volts or more, less than 4 feet above nearest crossarm carrying signal or communication circuits.
- 236.74 Protection of insulated wire; splice in underground wire.

This rule requires insulated wire be protected from mechanical injury. It prohibits puncturing insulation for test purposes and requires that splice in underground wire have insulation resistance at least that of the wire spliced.

Application:

Insulated wire shall be placed in wire runs, strung on pole line, or messenger, or buried in a manner that it cannot be damaged by the operation of apparatus, vehicles, tools, workmen, or by closing doors.

No insulated wire or conductor, whether in housing or outside, should be punctured for test proposes.

This rule does not permit temporary installation of cable or wires on top of the ground.

CLASSIFICATION OF DEFECTS

- 74.01 Insulated wire not protected from mechanical injury.
- 74.02 Insulation of insulated wire punctured for test purposes.
- 74.03 Splice in underground wire does not have insulation resistance value at least equal to the wire spliced.
- 236.76 Tagging of wires and interference of wires or tags with signal apparatus.

Each wire is required to be tagged or otherwise marked so it can be identified at each terminal. Nomenclature shall correspond to that of the circuit plan. Tags or other marks of identification are required to be made of insulating material and wires and tags are prohibited from interfering with moving parts of signal apparatus.

Application:

Applies to each wire at each terminal in all housings including switch circuit controllers, switch machines, and terminal or junction boxes.

Shunt wires inside switch circuit controllers are not required to be tagged as long as the carrier's nomenclature is uniform and corresponds to its circuit plans.

Signal wiring shall be tagged or otherwise marked at a terminal. A terminal is any point the wire terminates from its point of origin to and including the point of final termination. The wire may be tagged or marked in any manner so that it can be identified.

Breaks in a relay or other breaks that are identified on the circuit plan by the terminal post number meet the requirements of this rule. However, the circuit plan must be available in the signal case in such instances. If a carrier identified their wires in this manner, it would require every signal and cut section to have a circuit plan. If they do not, and the wires cannot be identified, the installation does not comply with this part.

All tag or wire identification should correspond with the circuit plan. All tags and identification should be of insulating material. Wires and tags shall not interfere with the moving parts or apparatus. This includes the contact members of relays, switch machines, interlocking machines, semaphore signal mechanism and apparatus, etc.

If it is necessary to pull the wire to identify it, the carrier is in non-compliance.

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**Section 236.76 Interference of wires with operating parts
of mechanisms.**

The FRA proposes that the requirements of this section and those contained in section 236.77 be combined into one section for purposes of brevity and clarity. This editorial change would require section 236.76 to be recaptioned and would permit section 236.77 to be deleted.

CLASSIFICATION OF DEFECTS

- 76.01 Wire not tagged or otherwise marked so it can be identified at terminal.
- 76.02 Nomenclature of tag or wire identification does not correspond to that of circuit plan.
- 76.03 Tag or other mark of identification in instrument case or apparatus housing not made of insulating material.
- 76.04 Tag interferes with moving parts of apparatus.
- 76.05 Wire interferes with operating part of mechanism.

INSPECTIONS AND TEST: ALL SYSTEMS

- 236.101 Purpose of inspections and tests; removal from service of relay failing to meet test requirements.

This rule prescribes certain inspections and tests of vital importance be made. The inspections and tests must be performed in accordance with carrier specifications which are subject to FRA approval. Electronic device, relay or other electromagnetic device which fails to meet requirement of specified tests must be removed from service and not restored to service until its operating characteristics are within the limits prescribed by the manufacturer.

Application:

Applies to all systems.

Purpose of inspections and tests is to determine if operating characteristics of relays and electromagnetic devices are within specified values and that apparatus and equipment is being maintained in condition to assure safety of train operation.

Section 236.101 Purpose of inspections and tests; removal
from service of relay failing to meet
test requirements.

This rule prescribes that certain FRA required tests shall be made and that all such tests are to be made to determine the apparatus and/or equipment is in condition to perform its intended function. Such inspections and tests must be made in accordance with the carriers specifications which are subject to the FRA's approval. The rule further requires that any apparatus and/or equipment failing to meet the requirements of a specific test shall not be continued in service but must be replaced, repaired or adjusted.

The existing requirements were contained in several sections of the 1939 rules. The revisions in 1950 consolidated those requirements into the present rule.

The current rule has served well and is a good rule. However, the parties agree that the language of the rule needs to be revised to recognize the technological advances in present day signal systems. The electronic or solid state signal system needs to be recognized. The proposed rule reflects these important considerations.

Section 236.101 - Purpose of inspection and tests; removal from service of relay or device failing to meet test requirements.

FRA proposed to revise this section primarily to recognize the state of the art in signaling, namely, solid state devices. One commenter stated that the proposed language, "the limits within which such a device or relay is intended to operate," is not necessarily synonymous with either safe operation or safe tolerances. The commenter recommended that the rule state precisely that it is the limits of either safe operation or safe tolerances which is intended.

This section has in the past applied, and will continue to apply, only to those devices that affect the safety of train operation. It is clearly understood and accepted throughout the industry that all such signal devices and apparatus must be so designed that the limits of their operating characteristics provide adequate safety margins. Therefore, the rule has been adopted as proposed.

CLASSIFICATION OF DEFECTS

- 101.01 Relay which failed to meet requirements of specified tests not removed from service.
- 101.02 Relay which failed to meet requirements of specified tests restored to service with operating characteristics not in accordance with the limits within which the relay is designed to operate.
- 101.03 Electromagnetic device other than relay, which failed to meet requirements of specified tests not removed from service.
- 101.04 Electromagnetic device other than relay, which failed to meet requirements of specified tests restored to service with operating characteristics not in accordance with the limit within which the electromagnetic device is designed to operate.
- 101.05 Electronic device which failed to meet requirements of specified tests not removed from service.
- 101.06 Electronic device which failed to meet requirements of specified test restored to service with operating characteristics not in accordance with the limits within which the electronic device is designed to operate.
- 236.102 Signal mechanism.

This rule requires a visual inspection of semaphore and searchlight signal mechanism at least once every six months. Tests of the operating characteristics are required to be made every two years.

Application:

Applies to all semaphore and searchlight type signal mechanisms. Record of six-month inspection is not required. The rule requires the observation of the searchlight mechanism while it is operated to all positions during the six-month inspection.

Tests of operating characteristics include pick-up, release, and working values. They may be recorded in either voltage or current values.

Section 236.102 Signal mechanism.

The 1939 rules required a signal mechanism to be inspected to ensure the apparatus was in safe condition. Tests were required as specified by the carrier, subject to approval by the ICC, and such tests had to be made at least once every two years.

The revision in 1950 resulted in the present rule which mandates inspections every six months and tests every two years.

The current rule refers to signal mechanisms. A difference of opinion among signal people has existed for many years as to whether this rule applies to both semaphore and searchlight signal mechanisms. The FRA and its predecessor, the ICC, applied this rule equally to semaphore and searchlight signals.

The parties agree that a clarification of the rule is needed. The parties have suggested that a change be made in the language of section 236.102 so it will only apply to semaphore signals and a new section be written, section 236.102a, which will only apply to searchlight signals. The FRA has reviewed this matter and proposes to recaption and amend this section to adopt the suggested clarification. The FRA proposes to revise the rule so that paragraph (a) would cover semaphore signal mechanism test requirements and paragraph (b) would cover searchlight signal mechanism test requirements.

CLASSIFICATION OF DEFECTS

- 102.01 Signal mechanism not inspected at least once every every six months.
- 102.02 Tests of signal mechanism operating characteristics not made at least once every two years.
- 102.03 Mechanical movement to all positions of searchlight mechanism not observed at least once every six months.
- 236.103 Switch circuit controller or point detector.

Switch circuit controllers and point detectors are required to be inspected and tested at least once quarterly.

Application:

Applies to all switch circuit controllers and point detectors in all systems required by Rules 236.6, 236.13, 236.51, 236.57, 236.202, 236.203, 236.334 and 236.342.

Inspection should determine general condition, such as extent of wear of bearings and connections, secure fastening, condition of contacts and shunt wires, wiring, gaskets, etc. in compliance with these rules.

Test should be made with gage placed six inches from point to determine proper adjustment and operation.

Section 236.103 Switch circuit controller.

The 1939 rule required a switch circuit controller to be inspected frequently and to be tested quarterly.

This rule was revised in 1950 as follows: "Switch circuit controller shall be inspected and tested at least once every three months."

There has been some confusion within the railroad industry concerning the application of this rule. Some carriers have believed that this rule applies to point detectors of power-operated switches. The FRA has never applied these requirements to such point detectors, but does agree that point detectors of power-operated switches should be tested.

The parties have proposed the rule be expanded to include test of point detectors because they realize that the carriers already make the test, and some submit, therefore, that such tests should be required. The FRA proposes to recaption this section and include the requirements that switch circuit controllers, point detector or circuit controller of hand-operated, mechanically-operated or power-operated switches be inspected and tested at least once every three months.

Section 236.103 - Switch circuit controller/point detector.

FRA proposed revision of this section to require point detectors on power-operated switches to be inspected and tested as frequently as switch circuit controllers. One commenter stated that if the proposal is read alone and out of context without reference to the NPRM, it could be wrongly construed to apply only to those switch circuit controllers, point detectors, or circuit controllers that are operated by switch-and-lock movements.

In adopting the final rule, FRA decided to change the language of the rule so that it clearly identifies all of the intended apparatus to be tested at least once every three months. This change should resolve the interpretive problem expressed by the commenter.

CLASSIFICATION OF DEFECTS

103.01 Switch circuit controller not inspected at least once every three months.

103.02 Tests of switch circuit controller not made at least once every three months.

103.03 Point detector not inspected at least once every three months.

103.04 Tests of point detector not made at least once every three months.

236.104 Shunt fouling circuit.

Shunt fouling circuit is required to be inspected and tested at least once quarterly.

Application:

Applies to all shunt fouling circuits in all systems.

Inspection should determine bonds and fouling wires are applied in compliance with Rules 236.51, 236.56, 236.57, and 236.58 at the proper places, intact and in good condition.

Test should be made at clearance point and both sides of insulated rail joints between points and frog by connecting 0.06 ohm shunt across rails and determining if track relay is in deenergized position.

CLASSIFICATION OF DEFECTS

- 104.01 Shunt fouling circuit not inspected at least once every three months.
- 104.02 Tests of shunt fouling circuit not made at least once every three months.
- 236.105 Electric lock.

This rule requires that electric locks be tested once every two years. It excludes forced drop type electric locks.

Application:

Applies to all systems and interlocking machines.

Locks failing to meet test requirements must be replaced. Electric locks of the non-forced drop type may be removed from service, repaired, and replaced in service.

Tests of operating characteristics include pick-up, release, and working values. They may be recorded in either voltage or current values.

CLASSIFICATION OF DEFECTS

- 105.01 Tests of electric lock not made at least once every two years. (Does not apply to electric locks of forced-drop type.)
- 236.106 Relays.

This rule requires that each relay used in vital circuits of wayside equipment be tested at intervals prescribed for its type of design.

Application:

Applies to relays used in vital circuits of wayside equipment in all systems.

Each relay is required to be tested at least once every four years except:

1. Centrifugal relays shall be tested at least once every 12 months.
2. Vane relays and D.C. polar relays shall be tested at least once every two years.
3. Relays with soft iron magnetic structure which tends to become permanently magnetized, shall be tested at least once every two years.

This rule is applicable only to relays in service. A new relay placed in service shall be tested at intervals prescribed for its type of design. A shopped relay, after being tested or repaired in the shop, is not considered in service until it is installed within a signal system.

A relay that has broken glass, high resistance contacts, burnt contacts, burnt ribbons, broken or bent contacts, improperly installed ribbons, or evidence of moisture or other foreign matter inside its housing is not properly maintained and is prohibited.

Tests of operating characteristics include pick-up, release, and working values. They may be recorded in either voltage or current values.

Section 236.106 Relays.

The 1939 rule required all relays to be tested every 2 years and a relay would be removed from service if such relay failed to meet the requirements of the specified test. The 1950 revision kept the 2 year testing requirement, exempted locomotive relays and moved to section 236.101 the requirement that relays be removed from service if the relay failed to meet the test requirements. The test period for most relays can be extended without any reduction of safety. However, research has revealed that certain types of relays need to be tested at least every 2 years -- some even more often.

A review of the false proceed signal indications reported to the FRA by the nation's carriers since 1977 indicates that almost 30% of the false proceed signal indications attributed to defective relays were caused by AC centrifugal, AC vane and polar relays. The AC centrifugal relays alone represent 12% of the total of false proceed failures, although centrifugal relays make up less than 1% of the total relays in the nation. There are also still in service certain relays which use soft iron instead of silicon steel for the magnetic structure of the relay. This type of relay is subject to being permanently magnetized which would result in a significant safety hazard.

The FRA's proposed revision would relieve the industry from the expensive burden of unnecessarily testing relays which do not affect safety of train operations or relays which have no record of significant failures. However, it would retain the requirements of more frequent testing of those types of relay that present a significant safety hazard.

Section 236.106 - Relays.

FRA proposed to revise this rule to (1) require more frequent tests of certain relays with a high failure rate that is detrimental to safety of train operation; (2) require continued testing at two-year intervals of certain relays with known, less serious problems; and (3) to permit all other relays to be tested at four-year intervals. While agreeing that some relays which might affect the safety of train operation have proven to be rugged and reliable, one commenter stated that FRA should identify in a distinct manner those non-vital relays or relays which have no record of significant failures that are to be exempt from test requirements.

So called non-vital relays have never been within the scope of this section. The rule addresses only vital relays, i.e., relays the functioning of which affects the safety of train operation. In its proposal FRA identified in technical terms those specific relays to be tested at the various intervals. By doing so, it is not necessary to identify various relays built by several manufacturers that would require testing at those intervals. Accordingly, the rule has been adopted as proposed.

CLASSIFICATION OF DEFECTS

- 106.01 Tests of relay in service not made at least once every four years.
- 106.02 Tests of centrifugal relay in service not tested at least once every twelve months.
- 106.03 Tests of AC vane relay, D.C. polar relay, or relay with soft iron magnetic structure not tested at least once every two years.
- 236.107 Ground tests.

This rule requires a test for grounds on vital circuitry be made when placed in service and at least once every three months thereafter.

Application:

This test shall be made at energy buses supplying power to signal control circuits. The test is not required to be made on track circuit wires, AC distribution circuits grounded in the interest

of safety or common return wires of grounded common single break circuits.

Test shall be made by measuring the voltage potential between each energy bus and ground. If a voltage potential is detected between energy bus and ground, a current reading shall be taken to determine whether the ground is in excess of that permitted by Rule 236.2. In no case shall a current reading be taken when a train is closely approaching or passing, or a meter connected between an energy bus and ground be left unattended.

Section 236.107 Ground tests.

During consideration of sections 236.2 and 236.108, the FRA determined that a need exists for a rule requiring periodic testing of signal circuits for grounds. Section 236.2 requires that circuits be kept free of grounds but does not require the carrier to perform tests that will provide definite information as to the ground free condition of the circuits. On the other hand, section 236.108 requires testing of insulation resistance of wires and cables every 5 to 8 years.

The parties proposed the requirements of section 236.108 be changed to relieve the burden of what they consider to be unnecessary testing. But, in order to maintain the integrity and safety of the signal systems, the parties have recommended and agreed that a new rule should be adopted requiring a periodic ground test of all circuits affecting the safety of train operation. The parties agreed the proposed revision of section 236.108 and the proposed recaptioned new rule, section 236.107, would have the net result of providing significant relief from the testing requirements pertaining to the condition of insulation of signal conductors, but the integrity and safety of the signal systems would be maintained. It is the consensus of the parties to these proceedings that an improvement in safety would result if this proposal were adopted. The FRA concurs and proposes to adopt this new requirement.

CLASSIFICATION OF DEFECTS

107.01 Ground test on energy bus which furnishes power to circuits, the functioning of which affects the safety of train operation, not made when installed or at least once every three months.

236.108 Insulation resistance tests, wires in trunking and cable.

This rule requires tests of insulation resistance of wires in trunking and cable be made when installed and at least once every ten years thereafter. Conductor having insulation resistance of less than 500,000 ohm shall be tested annually.

In no case shall a conductor with insulation resistance of less than 200,000 ohms be left in service.

Application:

Tests must be made when wires, cables, and insulation is dry. However, wet conditions do not under any circumstances provide relief from Section 236.2.

Insulation resistance tests of each wire within trunking or within a cable must be tested to ground and tested against all other wires within the trunking or cable.

Single-conductor wire shall be tested to ground and is not required to be tested against all other wires in the cable run.

This rule applies to conductors and cables used for signal power.

Track wires, line wires and case wiring are excluded from the requirements of this rule.

Where a conductor is found with insulation resistance of less than 500,000 ohms, prompt action is required for repair or replacement of the defective wire or cable. Until repair or replacement, insulation resistance tests must be made annually. The reason for this provision is to allow lead time

for acquisition of new cable or scheduling of manpower. However, if material and manpower are available to effect repairs or replacement, corrective action shall be taken immediately.

Where a conductor is found with insulation resistance of less than 200,000 ohms, it shall be either repaired or removed from service.

Section 236.108 Insulation resistance tests.

The requirements of the rules adopted in 1939 regarding insulation resistance testing have remained virtually unchanged until the present time. The existing rule requires that low voltage conductors not designed for underground installation and installed underground or in trunking be tested every 5 years and minimum allowable resistance be maintained at 1 megohm. In addition, the rule requires that low voltage wires and cables not underground or in trunking, low voltage wires and cable designed for underground use and installed underground or in trunking, and local signal wiring will be tested every 8 years and minimum allowable resistance be maintained at 1 megohm. Lead covered signal power cables are required to be tested every 8 years and minimum allowable resistance must be maintained to at least 100 megohms. Underground signal power lines not lead sheathed must be tested every 5 years and minimum allowable resistance is 40 megohms for voltages up to 660 volts and 100 megohms for voltages over 660 volts.

It was submitted that this rule puts an unnecessarily large and costly testing burden on the carriers and the rule needs to be changed. It was proposed that a new rule, section 236.107, be adopted to require a periodic ground test of all signal circuits. Thus, the testing rule for signal wires and cables can safely be relaxed. It is the parties' position that protection and safety would actually be maintained and enhanced. The parties have agreed to this proposed revision of section 236.108. The FRA has carefully considered these suggestions and proposes to recaption and revise the rule.

CLASSIFICATION OF DEFECTS

- 108.01 Tests of insulation resistance not made within specified period.
- 108.02 Action not taken to promptly repair or renew conductor when its insulation resistance is below 500,000 ohms.
- 108.03 Circuit permitted to function on a conductor having insulation resistance value less than 200,000 ohms.
- 236.109 Time releases, timing relays and timing devices

This test requires that time releases and time relays be tested once every twelve months, and that timing be maintained at not less than 90% of the predetermined time interval, which shall be shown on the plans or marked on the time release or relay.

Application:

Applies to all systems. Tests should not be conducted while rail traffic is approaching or within any route involved in the test.

This test applies only to length of time.

Test shall be conducted by starting time release, time relay or timing device and checking time from opening of check contact (if used) until release of lever lock or energization of electric stick locking relay. Releasing time must not be less than 90% of that shown. It may be any amount of time over the predetermined time. Predetermined time interval must be shown on plans or marked on the time release or relay.

Section 236.109 Results of tests.

The requirements for records of tests have not been changed significantly since the adoption of the 1939 rules. The 1950 revision merely changed the numbers of the rules referred to in accordance with the new numbers of the 1950 rules and clarified the matter by providing that the records will be kept in the office of a divisional officer of the division where the tests were made.

Current technology permits the carriers to use data processing equipment to store information and print out test reports to be completed by field personnel. The parties agree such procedures would be desirable and recommend changes to the rule to recognize the computerized test forms.

The existing section requires that a record of tests be filed and kept at the office of the carrier officer responsible for such tests. Currently, there is no requirement for retention of such records. The parties agree that each record should be retained until the next record for that test is received but in no case less than one year.

This rule needs to be changed to reflect the changes proposed in this Part and make the rule more flexible to permit the use of data processing technology for recordkeeping and assure that records will be kept for a certain specified period of time rather than for an indeterminate period. The existing rule is vague and this proposal, which the FRA considers desirable in the interests of clarity, assures that cost effectiveness and safety will thus be achieved.

A proposal contained hereinafter would move section 236.385 to subpart A. The FRA proposes to recaption section 236.385 as 236.109 to maintain the logical order of this subpart. Therefore, the FRA proposes the provisions contained in existing section 236.109 be revised as herein discussed and adopted as section 236.110.

Section 236.385 Time releases and timing relays.

The requirements of the existing section, 236.385, were contained in the 1939 rules as section 136.4(c), (11). Editorial changes were made in 1950 but the requirements remained unchanged and the current rule reads: "Time releases and timing relays shall be tested at least once every three months. The timing shall be maintained at not less than 90 percent of the predetermined time interval, which shall be shown on the plans or marked on the time release or relay." The existing section applies only to interlockings and traffic control systems.

The parties have recommended that this section be moved to Subpart A and made applicable to all systems. Further, they have suggested that the testing period be extended to one year since the design of the time releases and time relays has given the industry timing devices which are very stable in their timing cycles. It was submitted that the carriers' records indicate no significant problems exist with timing devices. It was also pointed out the newest timers are electronic timers.

The FRA has considered the merits of the application of this rule to all systems and of the extension of the test period from 3 months to one year. The FRA believes making all systems subject to the requirements of this section would benefit safety and the extension of the test period would relieve the carrier of unnecessary testing without reducing the existing level of safety. The FRA proposes to revise this section as discussed and move the requirements to Subpart A and recaption it as section 236.109.

CLASSIFICATION OF DEFECTS

- 109.01 Time release not tested at least once every twelve months.
- 109.02 Timing relay not tested at least once every twelve months.
- 109.03 Timing device not tested at least once every twelve months.
- 109.04 Timing of time release less than 90 percent of predetermined time interval.
- 109.05 Timing of timing relay less than 90 percent of predetermined time interval.
- 109.06 Timing of timing device less than 90 percent of predetermined time interval.
- 109.07 Predetermined time interval not shown on plans or marked on time release, timing relay, or timing device
- 236.110 Results of tests.

This rule requires that the results of vital tests be recorded and filed in the office of the responsible division officer. It specifies those results to be recorded, prescribes the general format to be used and requires that the recording be made by the employee who makes the test.

Application:

The result of each required test must be recorded on a preprinted or computerized form designed for that purpose. Results of tests recorded on other than prescribed form is prohibited.

The form must show name of carrier, place, date, equipment tested, results of tests, repairs, replacements, adjustments, condition in which apparatus was left and signature of employee making the test. This required information may be shown in any order the carrier chooses and forms may provide for several tests. Equipment

Results of test made in compliance with 236.587 shall be retained for 92 days. Results of all other tests listed in this section shall be retained until the next record is filed but in no case less than one year.

tested refers to each piece of equipment tested in compliance with Rules 236.102 to 236.109 inclusive, 236.376 to 236.387 inclusive, and 236.576, 236.577, 236.586, 236.588, and 236.589.

Each form required by this rule shall be filed in the office of a supervisory official having jurisdiction. The divisional officer may be an assistant signal supervisor, signal supervisor, or any other divisional officer.

ATC, ATS and ACS test records shall be kept at test points.

CLASSIFICATION OF DEFECTS

- 110.01 Record of tests not made.
- 110.02 Tests not recorded on form.
- 110.03 Record of tests not complete.
- 110.04 Record of tests not filed with a supervisory official having jurisdiction.
- 110.05 Record of test form does not show name of railroad, place and date, equipment tested, repairs, replacements, adjustments made, condition in which apparatus was left, and signature of employee making the test.

SUBPART B - AUTOMATIC BLOCK SIGNAL SYSTEMS

STANDARDS

236.201 Track-circuit control of signals.

This rule requires that aspects of signals with indications more favorable than "Proceed at Restricted Speed" be controlled automatically by track circuits extending through the entire block.

Application:

Applies to automatic block and traffic control systems.

Rule 236.708 requires the limits of the block for last signal be defined.

The aspect and indication determine compliance with this rule. A carrier is in non-compliance if any aspect more favorable than "Proceed at Restricted Speed" is used even though the speed may be 20 miles per hour or less.

A block extends from signal to signal or from signal to its defined limits at end of the system.

This rule is not applicable to so-called distant or approach signals outside of a system.

RULE 136.201

This rule applies to automatic block signal systems. The 1939 rules contained the following provision:

Automatic Block Signal Systems

Standards

205. Signals shall be automatically controlled by continuous track circuits on main track and on other track where medium speed is permitted.

With no recorded objection, and no discussion in the Commission's report, the following rule was adopted by the Commission in 1950.

Subpart B, Automatic Block Signal Systems

Standards

136.201 Track circuit control of signals - -
Signals shall be controlled automatically by track circuits extending through the entire block.

The notice of proposed rule making issued in the instant proceeding proposed to change this rule to the following with the underlines showing the proposed changes:

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

Subsequently, after informal discussions between all parties, it was suggested that the term "signal" should be qualified by the insertion of the word "home" immediately preceding it, so that the proposed rule would read, again with all changes underlined:

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.

According to the Bureau, this rule as published in the notice of proposed rule making, is to be changed solely for clarity. The present rule has been interpreted by some as requiring that all aspects of a signal shall be controlled by track circuits. However, the indication of restricting aspects of less than stop, such as a proceed-at-restricted-speed aspect, precludes the aspect from being controlled by a track circuit, except through back contacts of relays, and it was never intended, says the Bureau, that such aspect should be so controlled. It is urged that the limitation of this rule to home signals merely adds additional clarity. As a practical matter the only signals to which the rule would not apply are so-called distant or distance signals. These are the first signals approaching automatic block territory not within the territory, they usually display a fixed yellow indication at all times, and they are different from operative approach signals. However, they are the same as approach signals which are inoperative. The usual approach signal, the type of signal which would be excepted from this rule, is one installed just before leaving non-signal territory, entering signal territory, serving merely to give the engineer notice that he is about to come into signal territory. As that signal has a fixed indication, there is no need to have the track circuited.

Reviewing the definitions:

Section 136.803 Signal, Approach - A roadway signal used to govern the approach to another signal and if operative so controlled that its indication furnishes advance information of the indication of the next signal.

Section 136.806 Signal, Home - A roadway signal at the entrance to a route or block to govern trains in entering and using that route or block.

Generally, all signals within an automatic block signal system are installed for the purpose and designed and constructed to display indications that the block is occupied. It follows, therefore, that they are all home signals under the Commission's definition. As before stated, the so called distant, or distance signals are also within our definition of approach signals because they qualify under the term "inoperative" as contrasted with "operative" as therein stated. But they are not home signals in any situation.

Much of the apprehension of the RLEA over this rule stems from its understanding of the term "home signal". It is apprehensive that limitation of this rule to home signals would remove much of the scope of the rule. However, as before stated, generally all signals within an automatic block signal system are home signals, though they function in one instance as an approach signal and in another instance as a home signal, and there is no void as feared by the protestants. The protestants characterize home signals as in the "minority" but this is because of a misunderstanding of the definition of home signals. Their apprehension

over the excepting of the aspect "restricted speed", or less favorable indications, from the rule is also motivated in part by some loose terminology and lack of uniformity in the industry in regard to signal systems. Yet, most, if not all carriers, either define "home signal" the same as it is defined by the Commission, or they have included no definition of home signals in their book of rules.

Discussion and Findings Rule 136.201. As seen, the apprehension of the protestants about the insertion of the qualifying term "home" in front of "signal" is based on confusion as to the meaning of the term. But such confusion should be cleared up by now, as it is clear on this record that the insertion of the term does not in fact remove any signals from the rule except inoperative approach signals and some others of the same practical no-need for track circuits. The other question here presented is more difficult of understanding and solution but the fact remains that the actual application of the rule has been as now proposed for over 10 years and there has been no adverse result. In the circumstances it shall be revised as proposed.

Rule 201

Track circuit control of signals. --~~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.

The present rule has been interpreted by some as requiring that all aspects of a signal shall be controlled by track circuits. However, signal circuits are designed so that aspects of all signals cannot be controlled automatically by track circuits. Some railroads use the red indications on certain signals to mean "proceed at restricted speed" through the block. Such an aspect can only be controlled through the back contacts of a relay and cannot be controlled automatically and therefore should not be included within the rule. Proposed rule 201 would also not apply to so-called distant or approach signals. These are the first signals a train passes before entering an automatic block signals system territory and usually display a fixed yellow indication which is not controlled by a track circuit. The inoperative distant or approach signals do not function automatically as home signals.

RLEA calls attention to the insertion in the rule of the word "home" in front of signal, making the rule applicable only to home signals. The intent of the change in the rule is to clarify it so as it will only apply to signals within an automatic block signal system and will exclude the distant or approach signal outside of the block signal system.

With this explanation, we find that the rule should be revised as proposed.

CLASSIFICATION OF DEFECTS

201.01 The control circuits for home signal aspects more favorable than "proceed at restricted speed" not controlled automatically by track circuits extending through the entire block.

236.202 Signal governing movements over hand-operated switch.

Signal governing movements over hand-operated switch is required to display its most restrictive aspect when the points are not in proper position.

Application:

Applies to both automatic block and traffic control systems.

This rule requires each switch to be so interconnected with the signal system that when the switch is not in proper position each signal governing movements over the switch will display its most restrictive aspect.

This rule does not apply to spring switches.

This rule applies to the circuitry necessary to obtain requirements and does not apply to defective conditions such as circuit controller adjustments, absence of shunt wires, etc.

CLASSIFICATION OF DEFECTS

202.01 Signal does not display its most restrictive aspect when points of facing-point hand-operated switch over which it governs movements are open one-fourth inch or more.

202.02 Signal does not display its most restrictive aspect when points of trailing-point hand-operated switch over which it governs movements is open three-eighths inch or more.

202.03 Signal which displays a separate aspect for facing movements over hand-operated switch in the normal and in the reverse position does not display its most restrictive aspect when the switch

points are open one-fourth inch or more from either the normal or reverse position.

236.203 Hand-operated crossover between main tracks; protection.

This rule requires that hand-operated crossover between main tracks provide protection for train movements by either an arrangement of one or more track circuits and switch circuit controllers; facing-point locks on both switches operated from a single lever; or, by electric locks on both switches of the crossover.

Signals governing movements over either switch must display their most restrictive aspect when either switch is not in proper position, the crossover is occupied by a train, locomotive, or car; where facing-point locks are used, either switch is unlocked; and, where electric locks are used, before the electric locking releases. Relief is provided for certain conditions adverse to shunting.

Application:

Applies to both automatic block and traffic control systems.

Relief of the shunting requirements does not exceed that of rule 236.51 - where such conditions are known to exist, adequate measures to safeguard train operation must be taken.

These requirements apply to crossovers between main track and signaled siding in traffic control territory.

Time or approach locking must be provided for electric locking.

Inspectors should be alert for staggered insulated rail joints that will permit undetected occupancy by a locomotive or car where one or more track circuits and circuit controllers are used. Such defective conditions are prohibited by rule 236.51.

Arrangements meeting the requirements of paragraphs (2) or (3) do not require the use of track circuits.

This rule prohibits the use of fouling sections only.

RULE 203

The only objection to this rule is by the Atchison, Topeka and Santa Fe system lines, hereinafter collectively referred to as the Santa Fe. Their sole objection is that the rule is not made subject to footnote 5, which provides that existing installations be brought into conformity with certain other rules within a period of 5 years. At the cross-examination of their witness they modified their request for time within which to comply with this rule to a period of 3 years. They equipped 134 crossovers with special track circuits or electric locks and have 328 to be still equipped to comply with the rule. They are carrying out an extensive program of signal installation, including the installation of automatic train stop on 2,930 miles of track in compliance with our order in Applicances and Systems to Promote Safety of Operation, 268. I. C. C. 547, which will tax their signal construction forces for over 2 years. Considering the number of crossovers to be equipped and the present program of signal installation, the Santa Fe will be given until December 31, 1952, the date on or before which compliance with our order in the case cited is required, to comply with the requirements of rule 203. No change in the rule is necessary.

CLASSIFICATION OF DEFECTS

- 203.01 At hand-operated crossover between main tracks protection not provided by one of the following: (1) An arrangement of track circuits and switch circuit controllers, (2) facing-point locks on both switches of the crossover, with both locks operated by a single lever, or (3) electric locking of the switches of the crossover.
- 203.02 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect when either switch of the crossover is open, where crossover protection is provided by track circuits and switch circuit controllers.
- 203.03 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect when crossover is occupied by a train, locomotive, or car in such manner as to foul the main track, where crossover protection is provided by track circuits and switch circuit controllers. (Explain fully condition of rail with respect to presence of sand, rust, dirt, grease or other foreign matter.)
- 203.04 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect when either switch of crossover is unlocked, where switches of crossover are provided with facing-point locks operated by a single lever.
- 203.05 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect before electric locking releases, where switches are electrically locked.
- 203.06 Electric locking releases before the expiration of pre-determined time interval after signals display their most restrictive aspect. (Applies only to electric locking of switches of hand-operated crossover between main tracks.)
- 236.204 Track signaled for movements in both direction, requirements.

This rule requires that on track signaled for movements in both directions a train shall cause

one or more opposing signals ahead of it to display the most restrictive aspect. Signals are required to be spaced or arranged to provide stopping distance for opposing trains.

Application:

In absolute permissive block signaling when a train passes a head block signal it must cause the opposing head block signal to display an aspect not more favorable than "stop."

Braking distances should be obtained from carrier's braking distance chart.

Rule 136.204

In the Rules becoming effective in 1939, the following requirement was established:

AUTOMATIC BLOCK SIGNAL SYSTEMS

Standards

207. On track signaled for movements in both directions, signals shall be so arranged and controlled that proper restrictive indications will be provided to protect both following and opposing movements.

In 1950 it grew into the following:

AUTOMATIC BLOCK SIGNAL SYSTEMS

Standards

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 an aspect requiring a stop. On such track signals shall be so arranged and controlled that if opposing trains can simultaneously pass signals displaying proceed aspects, and the next signal in advance of each such signal then displays an aspect requiring a stop, the distance between opposing signals requiring a stop 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.

In the Notice of Proposed Rule Making published in the instant proceeding it was proposed to establish this rule, captioned similarly, as follows:

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 not be more favorable than "proceed at restricted speed." Signals shall be so arranged and controlled that if

opposing trains can simultaneously pass signals displaying proceed aspects, 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 movement 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. In absolute permissive block signaling when a train enters the block between sidings the opposing head block signal shall display an aspect requiring a stop.

Since the publication of the Notice of Proposed Rule Making in this matter, all parties to the proceeding have been in informal conference, and it was there further proposed that the rule be changed to the following, the underlining indicating the total changes:

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 proceed aspects 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 display restrictive aspects shall be provided in approach to both such signals. 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.

In the Bureau's administration of this rule it has been confronted with the fact that some carriers have an operating rule, permitting a train to pass a permissive signal, not an absolute signal, at restricted speed without stopping, and the further fact that this constitutes a violation of the literal requirements of the first sentence of the present rule.

The practice of permitting trains to pass such signals at restricted speed without stopping is an, old one, on some roads, and it is in line with standard code rule 291 of the Association of Railroads, reading as follows:

Railroads desiring to avoid stopping trains
may arrange accordingly.

The Bureau takes the position that operation at restricted speed without stopping as encouraged by the Association of American Railroads is in fact a safe practice, and that the rule should be revised to legalize it under the conditions indicated. The Bureau also urges that the rule should be clarified in order to carry out the policy of the American Association of Railroads so that grades or tonnage signals may also be passed and properly used. Another reason urged by the Bureau, as support for the proposed revision, is that there are a few installations of automatic train control or automatic cab signals which are used without intermediate wayside signals, and in such cases when the train passes a wayside signal the conditions should allow continued movement at restricted speed.

The Bureau has consistently overlooked the literal requirements of the first sentence of this rule, and under the circumstances contemplated in this rule, it has gone along with (1) automatic signals permitting operation at restricted speed without stopping, (2) the use of grade or tonnage markers on automatic signals that permit a train to pass such signal without stopping when they display stop and proceed aspects, and (3) the use of an aspect permitting operations at restricted speed as the most restrictive aspect of an automatic cab signal. The revision of the rule is urged to carry out what is already the Bureau's interpretation and actual application of the rule.

The protestants object to the proposed change in the first sentence of rule 204. They argue that it would be obviously and inherently unsafe to allow opposing trains to move toward each other on single track, each at up to 20 miles per hour. It is their position that the signal aspect "proceed at restricted speed" is a highly dangerous signal aspect which should not be used (1) to permit opposing and conflicting moves in automatic block-signal and traffic-control territory, (2) for movements into interlocking route containing switch, frog or derail not in proper position, nor (3) for movements not protected by approach or time locking at interlocking. The RLEA favors the last sentence of the rule now proposed. It points out, however, that there is no better reason to require opposing stop signals with this

type block than it is for others and that if it is done for this type of signaling it should also be done for other types.

Discussion and Findings - Rule 136.204. The only statement in this rule in controversy here is its first sentence. At the outset, in considering that sentence, it must be understood that it is not remotely intended by it to authorize the movement of trains toward each other on the same block or within the same area of signal protection. The rule was not written in 1950, for opposing moves and it is not so written now. The purpose of the rule is solely to add flexibility for following moves. However, it is inherent in the type of signal system here involved that track occupancy be reflected in adjoining signals, regardless of the direction of the movement, and in order to allow the flexibility intended for following movements the rule must be established in the manner here proposed. It is merely incidental to this that the possibility of opposing moves arises, but this is not the purpose of the rule. On the contrary, the rule is framed with the fact clearly in mind that opposing moves on these lines are authorized only on time tables and train orders and never by signals alone. What this rule does now is make clearly valid what has always continued, under color of the Bureau's practical interpretation, ever since the oversight adoption of a literally-to-the-contrary requirement in 1950. The Examiner finds that this rule should be revised as last proposed.

Rule 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 an aspect requiring a stop the most restrictive aspect, the indication of which shall be not more favorable than "proceed at restricted speed." ~~On such track~~ Signals shall be so arranged and controlled that if opposing trains can simultaneously pass signals displaying proceed aspects 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 requiring a stop 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. 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.

Some carriers have an operating rule which permits a train to pass a permissive signal at restrictive speed without stopping.⁴ Permissive signals are identified by the use of a number plate or other identification attached to the mast of the signal indicating to the engineer that these are permissive signals which may be passed at restricted speed without stopping. Absolute signals, on the other hand, are not so marked and trains are required to stop at such a signal without exception. The passing of a permissive signal without stopping constitutes a violation of the literal requirements of the present rule.

The Bureau takes the position that operation at restricted speed without stopping as permitted by the rules of the AAR is safe and that the rule should also be clarified in order to permit the use of grade or tonnage signals. These signals are used on several railroads where the grades are severe and it is not desirable to stop heavy trains on grades. There are also a few installations of automatic train control or automatic cab signal systems which are used without intermediate wayside signals. In such cases when the train passes a point where the cab signal indication changes, the proposed rule would allow continued movement at restricted speed.

⁴The practice of permitting trains to pass permissive signals at restricted speed without stopping is permitted by rule No. 291 of the AAR's Standard Code of Operating Rules.

RLEA objects to the proposed change in the first sentence of rule 204. They argue that it would be unsafe to allow opposing trains to move toward each other on single track, each at up to 20 miles per hour. It is their position that the signal aspect "proceed at restricted speed" is highly dangerous and should not be used to permit opposing and conflicting moves in automatic block-signal and traffic control systems, or for movements into and through interlockings containing switch frog or derails not in proper position.

The exception taken by the RLEA to the first sentence of this rule is based on the fact that it would permit opposing movements at restricted speed. The RLEA does not, for the purpose of this rule, oppose movement at restricted speed in the same block for following movements.

In reply to the exception of the RLEA, AAR argues that the industry has permitted opposing movements in the manner here proposed for many years without ill effect; that the primary control of trains in single track automatic block territory is by time-table and train orders and not by signal indication; and that even if the time-table and train orders are in error or are not complied with, the opposing movements would be prepared to stop short of another train or obstruction. With respect to the Eufola accident⁵ cited in RLEA's exceptions, AAR correctly concludes that the cause of the collision was not found to be attributable to the design of the signal system.

The proposed rule accords with operating practices long followed by the industry and there is no concrete showing that such practices impair safety. We therefore find that the rule should be revised as proposed.

⁵ Accident Report No. 3998 concerning an accident on the Southern Railway at Eufola, N. C.

Section 236.204 Track signaled for movements in both directions, requirements.

The parties have recommended an editorial change be made in the last sentence of this rule to more clearly state the intent of the rule. The FRA has considered the change and agrees it will be beneficial because it does clarify the rule. The FRA proposes to revise the last sentence to read: "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 with an indication not more favorable than stop." This revision would clarify that a train stopped at such a headblock signal could not proceed except by authority of the dispatcher or under flag protection.

CLASSIFICATION OF DEFECTS

- 204.01 On track signaled for movements in both directions a train does not cause one or more opposing signals immediately ahead of it to display the most restrictive aspect the indication of which is not more favorable than "proceed at restrictive speed."
- 204.02 On track signaled for movements in both directions where opposing signals are spaced stopping distance apart for movements in one direction only, signals not arranged so that a restrictive aspect will be displayed by at least one of the signals in approach of the opposing signals, when such approach signals are passed simultaneously by opposing trains.
- 204.03 On track signaled for movements in both directions where opposing signals are spaced less than stopping distance apart for movements in one direction, signals not arranged so that restrictive aspects will be displayed by both signals in approach of the opposing signals for trains passing such approach signals simultaneously.
- 204.04 In APB signaling, train passing head block signal does not cause opposing head block signal to display an aspect not more favorable than "stop."
- 236.205 Signal control circuits; requirements.
- Control circuits are required to be installed so that each signal will display its most restrictive aspect when the block it governs is occupied by a train, locomotive, or car; a switch is not in proper position; an independently operated derail equipped with switch circuit controller is not in derailing position; when a track relay is in deenergized position or device that functions as a track relay is in its most restrictive state; or when a signal control circuit is deenergized.

Application:

Applies to both automatic block signal and traffic control systems.

A signal must display its most restrictive aspect when any of the conditions listed under (a), (c) or (d) of this rule occur. However, it is permissible, after the signal's most restrictive aspect has been displayed for such conditions, to operate manually by the operator or trainman a pushbutton, switch, lever or other device which gives an indication not more favorable than "proceed at restricted speed" obtained.

This rule is applicable to the design and installation of signal circuits and does not apply to defective equipment which appear to affect this rule, such as circuit controller adjustments, missing or broken signaling wires, dead section, track circuit failure, ground etc.

1. This rule does not require that the most restrictive aspect be red or stop aspect.

Section 236.205 Signal control circuits; requirements.

The requirements of the existing rule were contained in section 208 of the 1939 rules. The requirements were adopted with editorial changes in 1950 and have remained unchanged since that time. While the existing rule has served well and its requirements are still valid, the railroad industry has begun using electronic devices in lieu of track relays. These technological advances were discussed in connection with the changes proposed in sections 236.51 and 236.56. Those considerations apply to the instant rule.

Therefore, the FRA proposes to revise paragraph (d) of this section to recognize the use of electronic or solid state devices and prescribe their signaling performance.

CLASSIFICATION OF DEFECTS

- 205.01 Circuits not so installed that signal will display its most restrictive aspect when the block into which it governs train movements is occupied by a train, locomotive, or car.
- 205.02 Circuits not so installed that signal will display its most restrictive aspect when points of a switch in the block into which it governs train movements are not closed in proper position.
- 205.03 Circuits not so installed that signal will display its most restrictive aspect when an independently operated fouling-point derail equipped with switch circuit controller in the block into which it governs train movements is not in derailing position.
- 205.04 Circuits not so installed that signal will display its most restrictive aspect when a track relay within the block into which it governs train movements is in deenergized position.
- 205.05 Circuits not so installed that signal will display its most restrictive aspect when a device that functions as a track relay within the block into which it governs train movements is in its most restrictive state.
- 205.06 Circuits not so installed that signal will display its most restrictive aspect when its control circuit is deenergized.

236.206 Battery or power supply with respect to relay; location.

This rule requires that the source of energy be located at the end of the circuit farthest from the relay where open-wire circuit or common return circuit is used.

Application:

Applies to automatic block signal and traffic control systems. Does not apply to interlockings.

This rule prohibits use of loop circuits in vital circuitry.

CLASSIFICATION OF DEFECTS

206.01 Battery or power supply for signal control relay circuit not located at the end of the circuit farthest from the relay. (Applies only to open-wire circuit or common return circuit.)

236.207 Electric lock on hand-operated switch; control.

Electric lock on hand-operated switch is prohibited from being unlocked before control circuits of signals governing movement over switch are opened.

Approach or time locking must be provided.

Application:

This rule is applicable only to automatic block signal systems.

There are no requirements for the installation of electric locks in automatic block signal territory. However, if installed, such electric lock must comply with this rule.

Section 236.207 Electric lock on hand-operated switch;
control.

This rule was adopted in 1950 and prescribes the standards of an electric lock installed in automatic block signal territory. These provisions establish the minimum standards of performance when an electric lock is installed in automatic block signal territory.

The parties have proposed a mere editorial change in the wording of this rule. They feel the words, "signals governing movements over such switch," is more descriptive of the requirements than the present wording, "protecting such switch."

The FRA agrees and proposes to make the suggested changes in this rule.

CLASSIFICATION OF DEFECTS

- 207.01 Electric lock on hand-operated switch can be unlocked before control circuits of signals governing movements over such switch have been opened.
- 207.02 Approach or time locking not provided for electric lock on hand-operated switch.
- 207.03 Electric lock on hand-operated switch can be unlocked before expiration of predetermined time interval where time locking is provided.
- 207.04 Electric lock on hand-operated switch can be unlocked before expiration of predetermined time interval with approach circuit occupied where approach locking is provided.
- 207.05 Approach locking not effective.
- 207.06 Time locking not effective.
- 207.07 Approach or time locking of electric lock on hand-operated switch can be defeated by the unauthorized use of emergency device which is not kept sealed in the non-release position.

SUBPART C - INTERLOCKING STANDARDS

236.301 Where signals shall be provided.

This rule requires that a signal be provided to govern train movements into and through interlocking limits except over electrically locked hand-operated switch with either a pipe-connected derail or independently-operated electrically locked derail.

Application:

This rule applies to interlocking only. It does not apply to controlled points in traffic control systems.

Electric locks installed under this rule must conform to requirements of rules 314, 760, 768 without regard to speed.

All interlocked signals must be operative unless relief has been heretofore granted. The word "into" is defined as, "to or toward the inside of from outside; past or through the outer boundary or limit." The word "through" is defined as, "into one side, end or point and out of the other." Therefore, an inoperative red signal does not meet these requirements.

Signals shall be provided to govern movements into and through interlocking limits. A carrier utilizing red inoperative signals for movement of trains or engines into and through interlocking limits is not in compliance.

A signal is not required to govern movements over a hand-operated switch into interlocking limits if the hand-operated switch is equipped with an electric lock and a derail is provided at the clearance point that is either pipe-connected or locked electrically. There are no restrictions on train speed at such installations.

A non-electrically locked switch without derail may be utilized within interlocking limits provided a signal is provided to govern movements on all routes and speed does not exceed 20 MPH.

An electrically locked switch without derail but with signal governing movements out of the switch may be utilized without restriction on train speed.

Where an electrically locked switch and/or derail is used within the interlocking, locking must protect against all possible conflicting routes and once the locking has been released, it should be impossible to clear a conflicting route.

All electrically locked switches and derails within interlocking limits must have approach or time locking.

RULE 136.301

The order of April 13, 1939, does not contain a rule which may be categorized as the predecessor to the 1950 enacted rule 136.301. The 1950 rule that is the present rule, was enacted without objection or opposition, as follows:

Subpart C, Interlocking

Standards

136.301 Where signals shall be provided.--Signals shall be provided to govern the train movements into and through interlocking limits.

In the Notice of Proposed Rule Making in the instant matter it was proposed to enact the following rule, the underlining showing changes.

Subpart C, Interlocking

Standards

136.301 Where signals shall be provided.--Signals shall be provided to govern the train movements into and through the interlocking, except that a signal shall not be required to govern movements over a hand-operated switch into the interlocking if the switch is provided with an electric lock and a derail at the clearance point, either pipe-connected to the switch or independently locked electrically.

NOTE.--Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

However, in pleadings, and informal conference, among all parties, it was suggested that the rule return to the use of the phrase "interlocking limits" instead of merely the work "interlocking" and accordingly it was further proposed as follows captioned similarly.

136.301 Where signals shall be provided.--Signals shall be provided to govern train movements into and through interlocking limits, except that a signal shall not be required to govern movements over a hand-operated switch into interlocking limits if the switch is provided with an electric lock and a derail at the clearance point, either pipe-connected to the switch or independently locked, electrically.

NOTE.--Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

The underlined shows the changes on the latest proposal, compared with the present rule.

It should be emphasized that the entire change proposed in this rule pertaining to hand-operated switches only. And, then, only if the hand operated switch is provided with an electric lock and a derail at the clearance point. The Bureau points out that the Commission has granted relief in many cases from the present rule on the precise conditions now incorporated into the rule, and that, safety-wise, adequate or even greater protection is given under the present rule as the derail adds a physical deterrant to the fouling of the crossing. This would be coupled with the fact that the unlocking of the hand-operated switch by the operation could not be accomplished until all conflicting signals were placed in stop position. Of course, it is clear from Rule 301 that if an electric lock is not installed then there must be a signal.

The protestants object to the proposed revision of Rule 301. Their complaint is that the rule does not state, in clear terms, that access to the interlocking plant from the turnout side could only be made after the electric lock is released and the derail removed. They argue that under the plain meaning of the rule it would not be necessary to provide a signal for access to the interlocking on an alternate route and that alternate routes could go unprotected. In other words they are worried about the diverging route situation. Their second objection is that the Commission may in some instances allow the installation of an electric lock which would not be controlled by the operator of the interlocking plant, and that the lock might then be manipulated by someone having no coordinated interlocked control over conflicting movements through the plant.

Discussion and Findings - Rule 136.301: It should be noted, regarding the apprehensions of the protestants, that all electric locks installed under the proposed rule .301 would have to provide all of the locking protection required by rules 136.302 and 136.308. That is, rule .302 requires track circuits and route locking, and rule .308 requires that mechanical or electric circuits should be installed to prevent signals from displaying aspects which would permit conflicting movements. Therefore, if an electric lock is provided in lieu of the signal, (1) the switch equipped with the electric lock could not be opened if a signal for conflicting movement through the interlocking had been cleared, and (2) once the switch had been unlocked or the detector circuit occupied, it would be impossible for any signal to clear that would permit a conflicting movement. The same circuits would govern in either case. Virtually, the same approach or time locking protection would exist under the proposed rule as does exist under the present signal requiring rule. There will be no lack of coordinated control. It is found that this rule should be revised as proposed.

Rule 301

Where signals shall be provided.--Signals shall be provided to govern the train movements into the through interlocking limits, except that a signal shall not be required to govern movements over a hand-operated switch into interlocking limits if the switch is provided with an electric lock and a derail at the clearance point, either pipe-connected to the switch or independently locked, electrically.

The change proposed in this rule would provide an exception to the general rule of 301 in the case of hand-operated switches if the switch is provided with an electric lock, and a derail at clearance point is pipe-connected to the switch so that when the switch is operated the derail is simultaneously operated or if the derail is independently locked electrically. The Bureau points out that the Commission has granted individual relief, in many cases, from the present rule in the circumstances of the proposed exception. In the case of electric locking, adequate protection is afforded since the electric lock is unlocked by the tower operator and all conflicting signals must be placed in the stop position. RLEA states that the rule does not specify, in clear terms, that access to the interlocking plant from the turnout or switch involved could only be made after the electric lock is released and derail is removed. RLEA also contends that this rule should be clarified by the addition of a statement to the effect that rule 314 also applies here, and that this rule should be made a part of rule 301 to insure enforcement. In reply, AAR contends that the requirements in rule 301 are clear but that it would have no objection to the following interpretation:

Electric locks installed under Rule 301 must conform to the time and approach locking requirements of Rule 314 (without reference to the 20-mile exceptions), and those of either Rule 760 or Rule 768, as may be appropriate.

We find that the proposed rule should be adopted and that in the interest of clarity specific reference to rule 314 should be included in rule 301 as follows:

Where signals shall be provided.-- Signals shall be provided to govern train movements into and through interlocking limits, except that a signal shall not be required to govern movements over a hand-operated switch into interlocking limits if the switch is provided with an electric lock and a derail at the clearance point, either pipe-connected to the switch or independently locked, electrically. Electric locks installed under this rule must conform to the time and approach locking requirements of Rule 314 (without reference to the 20-mile exceptions), and those of either Rule 760 or Rule 768, as may be appropriate.

CLASSIFICATION OF DEFECTS

301.01 Signal not provided to govern train movements into and through interlocking limits. (Note: This does not apply to a turnout over a hand-operated switch into interlocking limits if the switch is provided with an electric lock and a derail at the clearance point, either pipe-connected to the switch or independently locked, electrically. Electric locks installed under this rule must conform to the time and approach locking requirements of Section 236.314 (without reference to the 20 mile exceptions), and those of either Section 236.760 or Section 236.768, as may be appropriate.)

236.302 Track Circuits and Route Locking.

This rule requires track circuits, and route locking where power operated switches are used, be provided throughout interlocking limits.

Application:

Applies to interlocking only.

Route locking shall be effective at a point not more than 13 feet in advance of the signal measured from the center of the signal mast or if there is no mast, from the center of the signal.

When a train or engine passes a signal displaying any type of proceed aspect, including "proceed at restricted speed," track circuits and route locking shall be provided. Electric locking, either in the interlocking machine or the wayside equipment, that prevents the movement of any switch, movable point frog, or derail in the route entered is required. However, it may be so arranged that after a train clears a track section of the route, the locking affecting that section may be released.

Route locking is not required nor provided where there is an absence of a power-operated switch, movable point frog or derail in the route.

RULE 136.302

The rules enacted in 1939 contain the requirement, in Rule .305, that "track circuits shall be provided throughout interlocking limits except when otherwise authorized by the Commission." In 1950 the rule became:

Subpart C, Interlocking

Standards

136.302. - Track Circuits and Route Locking.- Track circuits and route locking shall be provided throughout interlocking limits. (The footnotes to the rule, note 1, stating that relief may be granted upon an adequate showing, and note 2, giving a schedule for compliance are not important in the determination of this proceeding.)

As shown in the notice of proposed rule making in the instant proceeding the rule is set forth as follows captioned similarly:

136.302 Track circuits and route locking.- Track circuits and route locking shall be provided throughout the interlocking. Route locking shall become effective when the first pair of wheels of a locomotive or car passes a point not more than five feet in advance of the signal governing its movement.

Subsequent to the notice of proposed rule making it was suggested that the rule be enacted as next set forth captioned similarly the underlining indicates the important changes:

136.302 Track circuits and route locking.-Track circuits and route locking shall be provided. Route locking shall be effective when the first pair of wheels of a locomotive or car passes a point not more than 13 feet in advance of the signal governing its movement.

NOTE 2. - Existing installations on each railroad, which do not conform to the requirements of this section shall be brought into conformity within 5 years of the effective date of this rule.

The proposed revision of this rule stems from an accident occurring at an interlocking protecting the crossing of two railroads at grade. One of the contributing causes of the accident was the fact that the track circuit on one railroad through which the route locking was effected extended only to a point 17.6 feet in advance of the signal governing movements over the

crossing, whereas the Commission in its report covering its investigation of the accident held that the track circuit should extend to the signal. This was considered an improper installation of interlocking track circuits. The Commission based its findings in this matter on the requirements of Section 136.302 that track circuits and route locking shall be provided throughout interlocking limits, interlocking limits being defined as the tracks between opposing home signals of interlocking. Under this interpretation the insulated joints for track circuits in an interlocking must be placed opposite the signal and route locking must be effected as soon as the train passes a signal. However, as a practical matter insulated joints are almost never placed exactly opposite a signal. The gist of the rule here under consideration is to revise the rule so as to permit location of insulated joints not more than 13 feet in advance of a signal.

All of the parties are in agreement on the rule as last proposed except that the protestants see no need to allow such a lengthy time as five years within which to bring existing installations into conformity.

It is understood that the 13 feet is measured from the center of the mast.

Discussion and Findings - Rule 136.302. It is clear that the practicalities of this matter justify the leeway proposed for the location of insulated joints. The RLEA expresses doubt as to the 5 years allowed for conformity with this rule but, as seen, this is reasonable in the light of all the circumstances involved. The examiner finds that this rule should be revised as proposed.

Section 236.302 Track circuits and route locking.

The 1939 rules required as follows: "Track circuits shall be provided throughout the interlocking limits except when otherwise authorized by the Commission."

The 1950 revision of this rule deleted that portion, "except when authorized by the Commission," and added two footnotes. The first footnote provided that relief from the requirements of this rule would be granted on an adequate showing by a carrier and the second provided that all installations not in compliance would be brought into compliance on a percentage basis each year until 1955 when all installations would be required to be in compliance.

In 1964, as a result of the circumstances involved in a collision at an interlocking, a change was proposed to require that route locking be effective when the first pair of wheels of an engine passes a point not more than five feet in advance of the signal governing its movement. The five foot requirement was found to be unduly restrictive and the final rule adopted in 1966 set the distance at thirteen feet.

The existing rules, adopted in 1950, have a requirement that a loss of shunt of 5 seconds or less will not permit an established route to be changed at an automatic interlocking (section 236.309).

The interlockings existing at that time were largely either automatic or locally controlled manual interlockings. These circumstances have now changed so that there are a large number of remotely controlled interlockings where the loss of shunt within interlocking limits poses a distinct safety hazard where a remotely controlled switch might be operated under a train.

The parties have recommended revision of the existing rule to specifically identify the point from where the 13 feet is to be measured. In addition, they suggest the revision include a five second loss of shunt requirement for route locking. However, the cost of retrofitting the existing installations would be prohibitive, and for the purpose of assuring that this rule will be cost beneficial, all parties agree the requirements for loss of shunt should apply only to those power-operated switches installed after the adoption of the proposed rule.

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The recommended method of measuring the 13-foot standard is already followed by the FRA and the proposed section details this method.

The FRA agrees safety would be enhanced by requiring loss of shunt protection for power-operated switches hereafter installed. However, the FRA does not believe that this section (and later, section 236.408) is the appropriate place to add such provisions. The FRA believes section 236.309, captioned "Loss of shunt at automatic interlockings," should be revised to include power-operated switches hereafter installed. Thus, revision of section 236.309 will be proposed later in this NPRM.

CLASSIFICATION OF DEFECTS

- 302.01 Track circuits not provided throughout interlocking limits.
- 302.02 Route locking not provided throughout interlocking limits. (Note: Route locking shall be effective when the first pair of wheels of a locomotive or car passes a point not more than 13 feet in advance of the signal governing the movement.)
- 302.03 Route locking not effective.
- 236.303 Control circuits for signals, selection through circuit controller operated by switch points or by switch locking mechanism.

This rule requires control circuits of signal aspect with indications more favorable than proceed at restricted speed be selected through circuit controller or relay operated by circuit controller of each switch, movable point frog, or derail in the route governed. It requires each switch, movable point frog, or derail to be in proper position before such signal aspect can be displayed.

Application:

Applies to both interlocking and traffic control systems. This rule is not applicable to control circuits of aspects indicating "proceed at restricted speed."

Non-compliance with this rule should be reflected in indication locking tests for power-operated switches, movable point frogs and derails. Test hand-operated units by opening switch circuit controller contacts.

Each switch, movable point frog or derail shall have a circuit controller operated directly by switch points or by switch locking mechanism. Circuits shall be arranged so that the circuit controller will be in compliance with Section 236.334 or 236.342. An aspect more favorable than "proceed at restricted speed" must be selected through such switch, movable point frog or derail circuit controller.

The combination of indication or mechanical locking does not comply with this rule. A circuit controller

is required at each switch through which control circuits of aspects more favorable than "proceed at restricted speed" must be selected.

Switch selection circuits are required for each aspect of a power-operated signal with an indication more favorable than "proceed at restricted speed" regardless of whether the speed through the interlocking is restricted by carrier rule. Protection is required for facing and trailing movements.

This rule applies to all switches within traffic control and interlocking territory, including power, spring, hand, interlocked, electric and electro-pneumatic. It applies to all trailing movements through switches, including spring switches.

This rule requires a trailing spring switch signal in traffic control or interlocking to have its control circuits selected through the switch circuit controller.

Rule 303

The only objection to this rule is by the Great Northern. Its objection is that the rule does not clearly show whether it applies to power interlocking in which dynamic or battery indicated circuits must deliver indications which control the mechanical interlocking between switch and signal levers, and that it should be clarified. The rule clearly states that the circuits shall be selected through circuit controller operated directly by switch points or by switch locking mechanism or through relay controlled by such circuit controller for each facing-point switch, movable-point frog, or derail in the route governed, and needs no clarification. The combination of indications and mechanical locking referred to by the witness does not comply with this rule.

Rule 136.303

The 1939 rules contained the requirement, in paragraph 306, that "Signals governing movements over switches, movable point frogs, and derails shall be so controlled that indications to proceed can be displayed only when such units are in proper position." This evolved into the following rule in 1950.

Subpart C, Interlocking

Standards

136.303 Control circuits for signals, selection through circuit controller operated by switch points or by switch locking mechanism.--The control circuit for power-operated or slotted mechanical signal governing movements at higher than restricted speed in the facing direction over switches, movable-point frogs, and derails shall be selected through circuit controller operated directly by switch points or by switch locking mechanism, or through relay controlled by such circuit controller, for each facing-point switch, movable-point frog, and derail in the routes governed by such signal. Circuits shall be arranged so that such signal can display an aspect to proceed only when each such switch, movable-point frog, and derail in the route is in proper position. Such power-operated signals hereafter installed shall be controlled in this manner through circuit controllers or switch repeating relays for all switches, movable-point frogs, and derails in the routes governed by such signals.

In adopting the foregoing rule in 1950, the Commission discussed it briefly, saying only, at page 271:

The only objection to this rule is by the Great Northern. Its objection is that the rule does not clearly show whether it applies to power interlocking in which dynamic or battery indicated circuits must deliver indications which control the mechanical interlocking between switch and signal levers, and that it should be clarified. The rule clearly states that the circuits shall be selected through circuit controller operated directly by switch points or by switch locking mechanism or through relay controlled by such circuit controller for each facing-point switch, movable-point frog, or derail in the route governed, and needs no clarification. The combination of indications and mechanical locking referred to by the witness does not comply with this rule.

As indicated this rule applies to interlockings, and by incorporation in Section 136.401 it is also made applicable to traffic control systems. Here is the rule now proposed, with changes underlined:

136.303 Control circuits for signals, selection through circuit controller operated by switch points or by switch locking mechanism.--The control circuit for each aspect with indication more favorable than "proceed at restricted speed" of power-operated signal governing movements over switches, movable point frogs and derails shall be selected through circuit controller operated directly by switch points or by switch locking mechanism, or through relay controlled by such circuit controller, for each switch, movable point frog, and derail in the routes governed by such signal. Circuits shall be arranged so that such signal can display an aspect more favorable than "proceed at restricted speed," only when each switch, movable-point frog, and derail in the route is in proper position.

NOTE.--Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

The Commission's main motivation for changing this rule is to clarify a point in the present rule. Under the present rule some carriers have interpreted it as not to require switch selection circuits for any signal, no matter what aspects it could display, if the speed through the interlocking were restricted by timetable or special instructions to not exceeding 20 miles per hour. This was not the intent of the present rule. The Commission's position on the matter is that switch selection circuits are required for each aspect of a power operated signal with an indication more favorable than proceed at restricted speed regardless of whether the speed through the interlocking is restricted by rule. The proposed rule clarifies this, and it also omits slotted mechanical signals for the reason that they are obsolete and no longer in service. While the present rule requires switch circuit selection for facing point switches, movable-point frogs and derails only, in service at the time the rule was last revised, the proposed rule has greater scope and requires such selection for all switches, movable point frogs and derails, no matter when installed or in which direction they face, and accordingly, the last sentence of the present rule has been deleted. The second sentence of the rule has been revised by substituting after "aspect" the words "more favorable than proceed at restricted speed" for the words "to proceed," in order to agree with the first sentence of the rule which requires switch selection control

of circuits only for those aspects more favorable than "proceed at restricted speed." Also, the word "such" has been deleted before the word "switch" in this sentence. The footnote to the present rule has been eliminated since it is no longer applicable and the standard footnote providing for relief upon an adequate showing and recognizing relief heretofore granted, has been added. However, as indicated early in this report, the proposal, now, concurred in by all, is to insert a provision to this effect in the rules applicable to them all, not just to certain ones, and this shall be done.

The AAR supports the proposed change in this rule, except that it opposes the retroactive part of the change and would suggest that the proposed rule be qualified as follows:

,except that such protection will not be required for existing trailing point switches, movable point frogs, or derails presently not so equipped.

The AAR points out that the rule passed in 1950 required circuit control selectors only for facing point switches and that this rule, adopted in 1950, constituted recognition by the Commission of the safety of existing trailing point switches without the described circuit controller selectors. They point out that in line with this, now for a period of more than 12 years; they have not provided the described protection for trailing point switches and the rule then allowed for the past 50 years of trailing point switches. In the opinion of the AAR safety would not be impaired by exempting trailing point switches as other means are provided (1) for checking the position of these switches, and (2) to prevent clearing of related signals in the event such trailing point switches are not in proper position for train movement. The AAR insists that the cost which would be involved in bringing all existing trailing point switches in compliance with the proposed rule would be very substantial approximately \$500,000, and without any advantage insofar as can be seen. Insofar as is within the records of the AAR there has never been an accident because of a train running through a trailing point switch which would have been avoided had the protection here envisioned been in effect.

The protestants do not like the present rule. Their objection to the proposed rule is very much a carry over of their objection to the present one, that is, they do not like the exemption from the rule applicable to movements at restricted speed. They would favor switch circuit selectors for movements such as are here involved regardless of speed. In fact, they suggest the following rule rather than either the present or the proposed:

136.303 Control Circuits for Signals, Selection Through Circuit Controller Operated by Switch Locking Mechanism.- The control circuit for each aspect with indication more favorable than "stop" of power-operated signal governing movements over switches, movable-point frogs and derails shall be selected through circuit controller operated directly by switch points or by switch locking mechanism, or through relay controlled by such circuit controller, for each switch, movable-point frog and derail in the routes governed by such signal. Circuits shall be arranged so that such signal can display an aspect more favorable than stop only when each switch, movable-point frog, and derail in the route is in proper position.

The Bureau considers the counterproposal of the RLEA too restrictive and unnecessary as shown by industry experience over the past 12 years. It reminds the record that when a movement is authorized by signal indication to proceed over a route within an interlocking even by a proceed at restricted speed indication, a signal for conflicting route cannot be, repeat cannot be, displayed.

In respect to the objection of the AAR and its proposal to insert at the end of the rule the phrases "except that such protection will not be required for existing trailing point switches, movable point frogs or derails presently not so equipped" the Bureau is mainly desirous that when the many old interlocking plants now in existence are modernized that the carriers are then required to bring them into compliance with the proposed rule. It suggests a 5 year compliance period. The AAR agrees with the general proposition that all interlockings be brought into compliance upon their modernization.

Discussion and Findings - Rule 136.303. The RLEA opposes the proposed rule mainly because it does not like the present rule. It urges control circuits for each aspect with indication more favorable than "stop" but adduced no evidence showing poor experience with the present higher-than-restricted-speed requirement. On the contrary, the record shows the present rule to have been adequate except to the extent indicated by the Bureau, all of which would be corrected by the revision. The AAR is reasonable in urging a non-retroactive provision but the Bureau is equally right in insisting that the many old and obsolete interlockings should be brought into full conformity when they are modernized, as they are likely to be in the next few years. In the circumstances a 5 year provision would appear to allow sufficient time for there conformance but in any event in special cases the time might be extended upon proper petition. The rule shall be revised as proposed in the Notice, except that 5 years will be allowed within which to bring existing interlockings in conformity respecting trailing point switches, movable point frogs and derails not presently so equipped.

Rule 303

Control circuits for signals, selection through circuit controller operated by switch points or by switch locking mechanism.-- The control circuit for each aspect with indication more favorable than "proceed at restricted speed" of power-operated ~~or slotted mechanical~~ signal governing movements ~~at higher than restrictive speed in the facing direction~~ over switches, movable point frogs and derails shall be selected through circuit controller operated directly by switch points or by switch locking mechanism, or through relay controlled by such circuit controller, for each ~~facing point~~ switch, movable-point frog, and derail in the routes governed by such signal. Circuits shall be arranged so that such signal can display an aspect ~~to proceed~~ more favorable than "proceed at restricted speed," only when each ~~such~~ switch, movable-point frog, and derail in the route is in proper position. ~~Such power-operated signals hereafter installed shall be controlled in this manner through circuit controllers or switch-repeating relays for all switches; movable point-frogs; and derails in the routes governed by such signals.~~

The only issue raised on exceptions concerning the proposed rule is the inclusion in the examiner's report and recommended order of the following:

Note. Existing installations on each railroad, which do not conform to the requirements of the section shall be brought into conformity therewith on or before December 31, 1969.

AAR excepts to this requirement and urges that the following be adopted instead:

Note. Existing installations that do not meet the trailing-point switch, movable-point frog, or derail requirements shall be brought into conformity with such requirements when major modification of the interlocking is made.

The requirements of the rule provide for selection of the control circuits for certain signals through switch circuit controllers or switch repeating relays and apply to both interlockings and traffic control systems. The present rule requires switch circuit selection for facing point switches, movable point frogs and derails in service at the time the rule was revised in 1950, and for all switches, movable point frogs and derails installed thereafter. The rule revision proposed by the Bureau and recommended by the examiner would require switch circuit selection for all switches, movable point frogs and derails no matter when installed. This revision will apply to trailing point switches, movable point frogs and derails not now provided with switch circuit selection. The Bureau in reply to AAR's exception points out that:

In 1950 the railroads as here then contended a trailing point protection requirement would impose unnecessary expense on the carriers and anyway the older interlocking would be replaced or rehabilitated gradually at which time trailing point protection would be provided. Fourteen years have since passed and yet there is no assurance that these installations will be provided with that protection in the foreseeable future. Hence to apply some impetus to providing trailing point protection at all interlocking, a time limit for compliance should be set.

We find that a definite time limit for compliance should be established for the reasons stated by the Bureau. If the definite time limit, which we will establish as December 31, 1970, causes unnecessary hardship in particular cases, the provision in the rules for individual relief upon an adequate showing is available.

CLASSIFICATION OF DEFECTS

- 303.01 Control circuit for signal aspect with indication more favorable than "proceed at restricted speed" of power-operated signal governing movements over switches, movable-point frogs, and derails not selected through circuit controller operated directly by switch points or by switch locking mechanism, or through relay controlled by such switch circuit controller on each switch, movable-point frog, and derail in the routes governed by the signal.
- 303.02 Control circuit for signal aspect with indication more favorable than "proceed at restricted speed" is not so arranged that such aspect can only be displayed by a signal when each switch, movable-point frog, and derail in the route governed is in proper position.
- 236.304 Mechanical locking or same protection effected by circuits.

This rule requires that mechanical locking or the equivalent protection by means of circuits be provided at each interlocking.

Application:

Each interlocking is required to be so arranged either mechanically and/or electrically so that operation of controlling devices or apparatus must succeed each other in proper sequence before a proceed aspect can be displayed.

CLASSIFICATION OF DEFECTS

- 304.01 Mechanical locking, or the same protection effected by means of circuits not provided.
- 236.305 Approach or time locking.

This rule requires approach or time locking be provided in connection with signals displaying aspects with indications more favorable than proceed at restricted speed.

Application:

Any signal that displays an aspect more favorable than proceed at restricted speed must have approach or time locking.

This is applicable to any aspect more favorable than "proceed at restricted speed" no matter what speed restriction the carrier has on the track. For example, a green aspect interlocking signal that does not have approach or time locking where the speed is 10 mph does not comply with these requirements.

This rule requires the time or approach locking be effective for the maximum authorized speed permitted on each route.

RULE 136.305

The 1939 rules contained the requirement:

INTERLOCKING

Standards

309. Approach or time locking shall be provided in connection with signals governing movements at high or medium speed.

In 1950 this was changed to:

SUBPART C, INTERLOCKING

Standards

* * *

Section 136.305 Approach or time locking.
Approach or time locking shall be provided in connection with signals governing movements at higher than restricted speed.

It is now proposed that this rule be changed as indicated by the underlines:

SUBPART C, INTERLOCKING

Standards

* * *

136.305 Approach or time locking.--Approach or time locking shall be provided in connection with signals displaying aspects with indications more favorable than "proceed at restricted speed."

The reason for the proposed change in this rule is the same as one of the reasons motivating the proposed change in rule 136.303, that is to eliminate circumvention of the rule by carrier imposition of a time table rule or special instruction limiting train movements through the interlocking to under 20 miles per hour. The intent of the rule, and the clear wording of the proposed rule, is that if the signals have aspects which can be displayed which are more favorable than proceed at restricted speed, then approach or time locking is required. The Commission has never required nor intended to require approach or time locking for signals displaying aspects only for restricted speed or less.

The RLEA's opposition respecting this rule is not directed solely to the proposed change but rather to the present rule and the failure of the present and proposed rule to require approach or time locking for all signals displaying an aspect more favorable than stop. It argues that a proceed-at-restricted-speed aspect, displayed at the entrance to an interlocking, while telling the engineman to move ahead at restricted speed, does not without approach or time locking, offer any assurance that a conflicting route will not be opened by the control operator at the last moment before the proceed-at-restricted-speed train occupies the track within the interlocking. While admittedly once on the tracks within the interlocking no conflicting route could be set up, the RLEA is apprehensive that the interlocking home signal might be dropped suddenly to stop in advance of an under-20-miles per hour train, it might not be able to stop and without time locking a conflicting route could be immediately authorized.

In noting the RLEA position on time locking for all signals having aspects more favorable than stop, the Bureau points out that, as seen, there is no need for time locking for movements at restricted speed as by the very definition of the speed the movement must be prepared to stop at the home signal.

Discussion and Findings - Rule 136.305. The RLEA really objects to the present rule, not the proposed which in no way relaxes the present one. The same comments applicable to rule .303 apply here. In addition, as pointed out by the Bureau, the very definition of restricted speed requires that the train be operated so as to permit stopping short of another train or obstruction. It follows that the apprehension of the RLEA concerning the inability of the train to stop in the face of a red aspect being displayed suddenly on the home signal, is without basis. To assume that one particular signal is not to be obeyed is to assume that any and all may not be obeyed. This would, of course, create a hazard regardless of what we may do here but fortunately the assumption is groundless. The rule shall be revised as proposed.

CLASSIFICATION OF DEFECTS

305.01 Approach or time locking not provided in connection with signal displaying aspects with indication more favorable than "proceed at restricted speed."

305.02 Approach locking not effective.

305.03 Time locking not effective.

236.306 Facing point lock or switch-and-lock movement.

Facing point lock or switch and lock movement is required for mechanically-operated switch, movable point frog or split point derail.

Application:

Mechanically-operated, as applied to this part, refers to a switch, movable point frog or derail operated by the control operator from a central point by means of pipe connection. It would also apply to a mechanically operated cabin-type interlocking with the appurtenances operated by trainmen. It does not apply to hand-operated derails or switches.

CLASSIFICATION OF DEFECTS

306.01 Facing-point lock or switch-and-lock movement not provided for mechanically operated switch, movable point frog, or split point derail.

236.307 Indication locking.

This rule requires indication locking for operative approach signals of the semaphore type, power-operated home signals, power-operated switches, movable point frogs and derails, and for all approach signals, except light signals with all aspects controlled by polar or coded track circuits, or line circuits so installed that a single fault will not permit a more favorable aspect than intended to be displayed.

Application:

Applies to both interlocking and traffic control systems.

Indication locking is electric locking which assures that the operation of signal appliances succeed each other in proper sequence. Indication locking falls into three primary categories; levers, signals, and switches.

Depending upon the type of interlocking machine, indication locking of levers prevents the lever from being operated full-stroke until the operated unit has properly completed its movement, or prevents the final lever from being operated until all units have properly completed their required movements.

Indication locking of home signals prevents the established route from being changed. It prevents the operation of all switches, movable point frogs, derails, and other operative units in the route and prevents the clearing of conflicting signals. Indication locking of approach signals prevents the route governed by a home signal from being changed until the approach signal displays an aspect not more favorable than "Approach Next Signal Prepared to Stop."

Indication locking of switches, movable point frogs, derails and other operative units such as bridge locking members prevents the clearing of signals governing movements over the unit until it has completed its required movement.

Inoperative approach signals, mechanically-operated (pipe-connected) home signals and switches are excluded from these requirements.

Each operative approach signal of the semaphore type power-operated home signal, power-operated switch, movable-point frog or derail is required to be provided with indication locking.

Each operative approach signal of the light type shall be provided with indication locking except where its aspects are controlled by polar or coded track circuits, or by line circuits so arranged that a single fault will not permit a false proceed signal to be displayed.

Section 236.307 Indication locking.

The 1939 rules required: "Signals governing movements over switches, movable point frogs and derails shall be so controlled that indications to proceed can be displayed only when such units are in proper position," and also stated: "Indication locking or equivalent shall be provided for approach signals of semaphore type and power-operated home signals at manually operated interlockings."

The existing rule consolidating those provisions was adopted in 1950, and added an indication locking requirement for all approach signals installed thereafter except light signals controlled by coded track circuits or double wire line circuits. The language of the existing rule is vague and the term "double wire line circuit" has been subject to many interpretive arguments. Further, recent technological developments have provided other more cost effective means to safely control the approach signal aspects.

The parties propose changing the language of the rule to clarify it and to permit the use of other more cost effective circuits for approach signal control circuits. The FRA has considered these suggestions and proposes to change this section accordingly.

CLASSIFICATION OF DEFECTS

- 307.01 Indication locking not provided for semaphore type approach signal.
- 307.02 Indication locking not provided for power-operated home signal.
- 307.03 Indication locking not provided for power-operated switch, movable point frog, or derail.
- 307.04 Indication locking not provided for approach signal of the light type. (Applies to each light signal except light signal all aspects of which are controlled by polar or coded track circuits or line circuits so arranged that a single fault will not permit a more favorable aspect than intended to be displayed.)
- 307.05 Single fault in line circuit controlling approach signal aspect, where indication locking is not provided, permits more favorable aspect than intended to be displayed.
- 307.06 Indication locking not effective.

236.308 Mechanical or electric locking or electric circuits; requisites.

This rule prohibits display of conflicting aspects except on track used for switching movements only by one train at a time. Manual interlockings installed prior to October 1, 1950, are excluded provided simultaneous opposing movements are not permitted between stations on either side of the interlocking when it is unattended.

Application:

Mechanical locking, electric locking, or electric circuits are required to be installed so that signals cannot display aspects which permit conflicting movements.

Opposing signals on track used for switching movements only are excluded and may display aspect indicating "proceed at restricted speed" when used by only one train at a time. This arrangement

is prohibited for use by through trains. It is prohibited for more than one switch crew to perform movements on track used for switching only.

Unattended manual interlockings having signals that display conflicting aspects that are interconnected with automatic block signal systems meet the requirements of this rule.

Rule 308

The Burlington is the sole objector to this rule. It requests that that portion reading "provided that simultaneous train movements in opposite directions on the same track between stations on either side of the interlocking plant are not permitted" be eliminated, or modified to read "where simultaneous train movements in opposite directions on the same track between stations on either side of the interlocking plant are permitted, opposing signals shall be overlapped," contending that the rule would prohibit the use of a siding leading out of certain interlocking plants when they are unattended. The basic requirement of this rule is that mechanical or electric locking or electric circuits shall be installed to prevent signals from displaying aspects which permit conflicting movements. An exception is made in the last sentence reading: "Manual interlocking in service as of the date of this order at which opposing signals on the same track are permitted simultaneously to display aspects to proceed when interlocking is unattended, may be continued, provided that simultaneous train movements in opposite directions on the same track between stations on either side of the interlocking are not permitted."

This sentence is intended to apply to interlockings where opposing signals on the same track are permitted to display aspects authorizing conflicting movements when the interlocking is unattended. If the signals are overlapped as suggested by the Burlington, aspects authorizing conflicting movements cannot be displayed and the basic requirement of the rule is met.

In order to clarify the rule the last sentence is changed to read "Manual interlocking in service as of the date of this order at which opposing signals on the same track are permitted simultaneously to display aspects authorizing conflicting movements when interlocking is unattended, may be continued, provided that simultaneous movements in opposite directions on the same track between stations on either side of the interlocking are not permitted." This modification does not change the intent of the rule.

CLASSIFICATION OF DEFECTS

308.01 Signals can display aspects which permit conflicting movements. (Does not apply to signals that may display restricting aspects at the same time on a track used for switching movements only, by one train at a time, or to opposing signals on the same track at manual interlocking which are permitted simultaneously to display aspects authorizing conflicting movements when interlocking is unattended, provided that simultaneous train movements in opposite directions on the same track between stations on either side of the interlocking are not permitted.)

236.309 Loss of shunt protection; where required.

This rule requires that loss of shunt of 5 seconds or less, regardless if it occurs on the approach circuit or on a track circuit within the limits of an automatic interlocking, must not permit established route to be changed. It also requires that loss of shunt of 5 seconds or less shall not permit the release of route locking.

Application:

Applies to all automatic interlockings whether or not they are connected to other signal systems. Includes automatic drawbridges, manual interlockings arranged for automatic operation when unattended and interlockings having both automatic and controlled routes. Applies to route locking of power-operated switch installed after

Test for compliance on approach circuits should be made by placing a shunt on the approach circuit to establish a route. The route is established when the home signal displays an aspect authorizing movement into interlocking limits. After the route is established, remove the shunt while observing the home signal to assure its aspect does not change until after the expiration of five or more seconds. Each track circuit in the approach circuit should be tested.

Test for compliance on track circuits within interlocking limits should be made by making an operating shunt test into interlocking limits,

then place a shunt on the approach circuit of a conflicting route. Remove the shunt from the track circuit within interlocking limits while observing the conflicting route home signal to assure it does not clear until after the expiration more than five seconds. Each track circuit within interlocking limits should be tested.

Test for compliance at power-operated switch by clearing signal for movement over the switch; place a shunt on track circuit in approach to signal; place shunt on track circuit in advance of signal; remove shunt from track circuit in advance of signal and determine that switch cannot be operated for at least five seconds. If more than one track circuit is in the route locking circuit, check each circuit in turn.

Section 236.309 Loss of shunt at automatic interlocking.

During the discussion of sections 236.302 and 236.408, the parties recommended that loss of shunt protection be required on route locking for power-operated switches. It was further discussed that to require the carriers to come into compliance with such provisions would be a costly burden on the entire industry. A suggestion was made that loss of shunt protection be required on power-operated switches but all existing installations be grandfathered. The FRA proposes that section 236.309 be recaptioned and so revised that loss of shunt protection would be required on the route locking of all power-operated switches hereafter installed and will further propose to revise section 236.401 to make section 236.309 applicable to traffic control systems.

CLASSIFICATION OF DEFECTS

- 309.01 Loss of shunt for five seconds or less permits established route at automatic interlocking to be changed.
- 309.02 Loss of shunt of five seconds or less permits the release of route locking of power-operated switch, movable point frog, or derail. (Does not apply to power-operated switch, movable-point frog, or derail installed prior to February 27, 1984.)
- 236.310 Signal governing approach to home signal.

This rule requires that a signal be provided on main track to govern the approach with the current of traffic to any home signal. It excludes the first signal encountered when leaving yards or stations and authorized speed approaching home signal is not higher than slow speed. It provides for use of inoperative approach signal when authorized speed between home signals on route governed is 20 miles per hour or less.

Application:

Applies to both interlocking and traffic control systems.

A signal to govern the approach to a home signal is required on main track only. Auxiliary tracks are excluded regardless of how heavily traveled.

An approach signal is required for current of traffic only where normal operation is with the current of traffic.

A signal is not required to govern the approach to the first signal encountered when leaving a yard or station where all trains originate or stop if the authorized speed approaching the first signal encountered is not higher than slow speed. If trains are operated that do not stop at the yard or station, an approach signal must be provided. In addition, the first signal encountered must be within yard or station limits. If it is outside yard or station limits, it becomes the first signal encountered after leaving the yard or station and requires that an approach signal be provided.

Where speed between home signals of an interlocking or controlled point exceeds 20 miles per hour, an operative approach signal must be provided.

An operative approach signal must comply with Rule 236.803, i.e., its aspect must convey advance information about the indication of the home signal. This requires that operative approach signals be capable of displaying aspects less restrictive than, "approach next signal prepared to stop," when the home signal displays an aspect indicating proceed.

An approach signal capable of displaying a single aspect, yellow or lunar, is an inoperative signal.

An approach signal capable of displaying two aspects, red and yellow, is an inoperative signal in the application of this rule. It cannot furnish advance information about the indication of the home signal when the home signal displays an aspect indicating proceed.

An approach signal in non-signaled territory capable of displaying two aspects, yellow and green, is an operative signal.

An approach signal capable of displaying three aspects, red, yellow, and green, is an operative signal.

CLASSIFICATION OF DEFECTS

- 310.01 Approach signal not provided for home signal on main track. (Does not apply where home signal is the first signal encountered when leaving yard or station where authorized speed approaching such signal is not higher than slow speed).
- 310.02 Inoperative approach signal provided for home signal where authorized speed between home signals is greater than 20 miles per hour.
- 236.311 Signal control circuits, selection through track relays, and through signal mechanism contacts and time releases at automatic interlocking.

This rule requires that at all interlockings

the control circuit for aspect with indication more favorable than "proceed at restricted speed" be selected through relays or devices that function as track relays of all track circuits in the route governed or through repeating relays for such track circuits. Additionally, at automatic interlocking, such control circuits shall be selected through relays or devices that function as track relays of track circuits in all conflicting routes or through repeating relays for such track circuits; through signal mechanism contacts or through relay contacts closed when conflicting signals display stop aspects; and through normal contacts of time releases or timing devices for conflicting routes or contact of relays repeating the normal position of contacts on such time releases or timing devices.

Application:

Applies to both interlocking and traffic control systems.

This rule does not require control circuits at manual or remote controlled interlockings or controlled points be selected through track relays or devices that function as track relays on conflicting routes.

This rule does not apply to control circuits of "proceed at restricted speed" aspects except at automatic interlockings.

Rule 311

The Great Northern contends that this rule does not clearly indicate whether automatic interlocking signal control circuits may be selected through relays which repeat track relays, or must be selected through track relays directly, and requests that the rule be clarified to permit use of repeater relays.

We recognize that it is necessary in some instances to select control circuits through repeater relays and it was not intended that this rule be interpreted to prohibit this practice. The rule has been revised to read as follows:

The control circuits for aspects with indications more favorable than "proceed at restricted speed" shall be selected through track relays for all track circuits in the route governed or through repeating relays for such track relays. At automatic interlocking, signal control circuit shall be selected (1) through track relays for all track circuits in the route governed and in all conflicting routes within interlocking limits or through repeating relays for such track relays; (2) through signal mechanism contacts or relay contacts closed when signals for such conflicting routes display stop aspects; and (3) through normal contacts of time releases for such conflicting routes or contacts of relays repeating the normal position of contacts of such time releases."

Rule 136.311

The 1939 rules contained the following requirement:

INTERLOCKING

Standards

317. The proceed control circuits for home signal at automatic interlocking shall be broken through relays for all track circuits between home signals on the same and intersecting tracks, and through signal mechanism contacts or relay contacts repeating stop signal indications for conflicting routes and through normal contacts of time releases for conflicting routes.

In 1950, the Commission adopted the present rule, stating at 278 I.C.C. page 272:

The Great Northern contends that this rule does not clearly indicate whether automatic interlocking signal control circuits may be selected through relays which repeat track relays, or must be selected through track relays directly, and requests that the rule be clarified to permit use of repeater relays.

We recognize that it is necessary in some instances to select control circuits through repeater relays and it was not intended that this rule be interpreted to prohibit this practice. The rule has been revised to read as follows:

The control circuits for aspects with indications more favorable than "proceed at restricted speed" shall be selected through track relay for all track circuits in the route governed or through repeating relays for such track relays. At automatic interlocking, signal control circuit shall be selected (1) through track relays for all track circuits in the route governed and in all conflicting routes within interlocking limits or through repeating relays for such track relays; (2) through signal mechanism contacts or relay contacts closed when signals for such conflicting routes display stop aspects; and (3) through normal contacts of time releases for such conflicting routes or contacts of relays repeating the normal position of contacts of such time releases.

The rule now proposed, concurred in by all parties to this proceeding, reads as follows:

136.311 Signal control circuits, selection through track relays, and through signal mechanism contacts and time releases at automatic interlocking.--The control circuits for aspects with indications more favorable than "proceed at restricted speed" shall be selected through track relays for all track circuits in the route governed, or through repeating relays for such track relays. At automatic interlocking, signal control circuit shall be selected (1) through track relays for all track circuits in the route governed and in all conflicting routes within interlocking limits, or through repeating relays for such track relays; (2) through signal mechanism contacts or relay contacts closed when signals for such conflicting routes display stop aspects; and (3) through normal contacts of time releases for such conflicting routes or contacts of time releases for such conflicting routes or contacts of relays repeating the normal position of contacts of such time releases.

NOTE.--Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

The underlined footnote is new. By Section 136.401 this rule is made applicable to traffic control systems as well as to interlockings. Since the only new matter in this rule, as now suggested, is the footnote, and in view of the concurrence of all parties in adoption of a relief-giving footnote to all rules, as before discussed, there is no real issue remaining respecting this rule. Accordingly it shall be retained as last suggested without the unnecessary footnote. It would be surplusage even without the other note.

Section 236.311 Signal control circuits, selection through track relays, and through signal mechanism contacts and time releases at automatic interlocking.

The 1939 rules provided in pertinent part: "... that proceed control circuits for home signal at automatic interlocking be selected; through track relays for all track circuits within the interlocking; through signal mechanism contacts or relays repeating such signal mechanisms that would indicate all conflicting signals were at stop; and through the normal contacts of time releases for conflicting routes." In the 1939 rule there were no requirements for manual interlockings.

The present rule was proposed in 1950 with the Great Northern Railroad making the only comment regarding its concern that the wording of the rule would preclude the use of relays repeating track circuits. The rule was revised and adopted in 1950 to include repeating relays and remained unchanged until now except for a very minor editorial change in 1966.

The present rule does not recognize improved technology in railroad signaling or permit the use of electronic devices that function as track relays. The parties have proposed that this rule be changed to achieve this purpose. The FRA agrees and proposes the rule be recaptioned and revised accordingly.

CLASSIFICATION OF DEFECTS

- 311.01 Control circuit for aspect with indication more favorable than "Proceed at restricted speed" not selected through relays or devices that function as track relays for all track circuits in the route governed or through repeating relays for such track circuits.
- 311.02 Signal control circuit at automatic interlocking not selected through relays or devices that function as track relays for all track circuits in the route governed or through repeating relays for such track circuits.
- 311.03 Signal control circuit at automatic interlocking not selected through relays or devices that function as track relays for track circuits in all conflicting routes within interlocking limits or through repeating relays for such track circuits.
- 311.04 Signal control circuit at automatic interlocking not selected through signal mechanism contacts for signals on all conflicting routes or through relay contacts closed when such signals display stop aspects.
- 311.05 Signal control circuit at automatic interlocking not selected through normal contacts of time releases or timing devices for all conflicting routes or through contacts of relays repeating the normal position of contacts of such time releases or timing devices.
- 236.312 Movable bridge, interlocking of signal appliances with bridge devices.

This rule requires that interlocking of movable bridge be so interconnected with bridge devices that bridge must be properly locked and track properly aligned before a signal governing movements over the bridge can display an aspect to proceed.

Application:

There are three types of movable spans, bascule, lift and swing. Regardless of the type of bridge,

the sequence of operation for rail traffic is as follows:

1. The bridge must be seated, then locked.
2. The movable rails must be determined to be in proper surface and alinement with the rails on the abutment or fixed span.
3. Derails, if any, must be place in nonderailing postion.
4. Interlocked signal may then be operated to display proceed aspect.

For water traffic the sequence of operation is precisely the opposite.

Bascule and lift spans require bridge locking devices that can drive locking members between the movable span and abutment or fixed span only when the bridge is properly seated. Locking devices are required on both ends of lift spans. Only the lift end of bascule spans must be locked. When the locking members are within one inch of being fully driven, the bridge is considered to be properly locked. Bridge locks are not designed to hold the movable span down, but to determine that the bridge is properly seated. The movable rails of bascule and lift bridges frequently correctly aline before the bridge seats, hence the need of bridge locks.

Swing spans are properly seated when the wedges are driven to lift the span off the center pier. Consider swing spans locked when the wedges are within one inch of being fully driven. The latches of swing spans are not bridge locking members but are provided to stop swing bridges in proper alinement as it is being closed.

Rails which slide or lower to butt with those of the abutment or fixed span, or risers that slide into position in the movable joint must be locked in proper alinement.

Conley frogs are designed to be self alining and are not required to be locked or electrically checked for alinement. They are required to be checked for surface.

All movable joints are required to be locked or electrically determined to be in proper surface except for those on the hinged end of bascule bridges. If surface is checked electrically, closely inspect plungers for binding.

Movable joints are "soft" joints. The three-eighths inch requirement of this rule was not revised by the Track Safety Standards and movable joints are not required to be maintained to meet these standards.

At automatic and remote-controlled movable bridge interlockings, those devices used to detect and govern movement of water traffic such as audible devices, signal aspects and electric eyes are considered interlocking appliances and must operate in their proper sequence and perform their intended function.

All the rules of Subpart C are applicable to interlocked draw bridges.

Test of bridge locking is determined by withdrawing locking member or wedge one inch and determining whether or not control circuits are opened.

Test of movable rails for alinement is made by measuring difference in alined rails. Slide and lift rails should also be tested by manually applying lateral force to the movable rails.

Test of movable rails for surface should be made by placing a 3/8 inch obstruction on each rail seat and determining whether or not rail can be locked or, if electrically checked, whether or not circuit controller contacts are opened.

The RS&I does not define bridge locking, therefore it is permissible for the carrier to utilize any type of bridge locking they desire. The only requirement for the bridge lock is that the movable span must be locked with the fixed span.

Where an emergency release is provided at bridge locking, it is required to be kept locked or sealed. Operation of the emergency release shall not defeat the time or approach locking circuits.

RULE 136.312

The background here, in the 1939 rules, is as follows:

INTERLOCKING

Standards

319. When removable bridge is protected by interlocking, provision shall be made to insure that movements of the bridge devices succeed each other in a predetermined order, and that the movable span, tracks and switches within interlocking limits are locked in proper positions.

320. Movable bridge shall be equipped with mechanism to surface and aline bridge and track accurately and fasten them securely in position.

In 1950 the present rule was adopted:

136.312 Movable bridge, interlocking of signal appliances with bridge devices.--When movable bridge is protected by interlocking the signal appliances shall be so interlocked with bridge devices that before a signal governing movements over the bridge can display an aspect to proceed the bridge and track must be alined and locked, with the bridge locking members within 1 inch of their proper positions and with the track rail on the movable span within three-eighths inch of correct surface and alinement with the rail on the bridge abutment or fixed span.

The rule now proposed, changed slightly from the rule published in the Notice herein with the consent of all parties, reads as set forth below:

136.312 Movable bridge, interlocking of signal appliances with bridge devices.--When movable bridge is protected by interlocking the signal appliances shall be so interlocked with bridge devices that before a signal governing movements over the bridge can display an aspect to proceed the bridge must be locked and the track alined, with the bridge locking members within one inch of their proper positions and with the track rail on the movable span within three-eighths inch of correct surface and alinement with rail seating device on bridge abutment or fixed span.

The first underline shows the change as set forth in the notice, the latter the additional change resulting from subsequent informal conferences.

In the Bureau's administration of this rule it has been found that in the more modern drawbridge installations the track is not locked by means of plunger locks or some other types of mechanical lock, such as were found in older drawbridge interlockings. The seating of these locks in such cases

insured that the track was alined. However, in modern drawbridges such rail locks are not provided but the alinement of the track is insured and checked by circuit controllers or other types of electric devices. It is believed that these devices are just as reliable, if not more so, than the old mechanical locks to insure correct alinement of the track rails, and in any event these rail locks did not possess sufficient mechanical strength to prevent the bridge from moving in case the bridge locking device failed. Accordingly, since the present rule requires that the track be alined and locked, in order to conform to modern developments in drawbridge interlocking practice the requirement that the track be locked has been omitted from the revised rule, which requires that the bridge only be locked and the track alined. All parties to this proceeding concur in the revision of this rule as last set forth above. In the circumstances it shall be so revised.

Section 236.312 Movable bridge, interlocking of signal
appliances with bridge devices.

The 1939 rules required that, when movable bridge was protected by interlocking, provision would be made to insure that movements of bridge devices succeed each other in a predetermined order and the bridge and track devices be locked in their proper positions with proper mechanisms to accurately align, surface and secure the movable span and track in place.

The rule adopted in 1950 consolidated the requirements into a single rule and specified that the bridge locking members be within one inch of their proper position and the track rail on the movable span be within three-eighths of an inch of correct surface and alignment. The rule also specified the bridge and track must be locked.

The 1966 revision changed this rule to the existing language because the more modern installations no longer used rail locks but used self aligning frogs with switch circuit controllers or other type of electric devices to assure correct track surface and alignment. The present rule adopted in 1950, and revised in 1966, requires the bridge to be locked and the track to be correctly aligned.

The operating panel of each drawbridge usually provides for an "emergency release" or "by pass" switch or device to permit the bridge to be operated when trouble occurs with signal circuits protecting the bridge. This switch or device is usually provided with a means to lock or seal the switch or device. However, there is no existing requirement that the switch or device be locked or sealed.

The parties have recommended that a sentence be added to the end of this rule to make the use of the emergency switch or by pass device more difficult so it cannot be used for routine operations. Therefore, the FRA proposes to add a provision requiring emergency bypass switches and devices to be locked or sealed.

CLASSIFICATION OF DEFECTS

- 312.01 Signal appliances at movable bridge protected by interlocking not so interlocked with bridge devices that before a signal governing movements over the bridge can display an aspect to proceed the bridge must be locked and the track properly alined.
- 312.02 Signal governing movements over movable bridge protected by interlocking can display aspect to proceed with bridge locking members displaced more than one inch from their proper position.
- 312.03 Signal governing movements over movable bridge protected by interlocking can display aspect to proceed with the track rail on the movable span more than three-eighths inch from correct surface with the rail seating device on the bridge abutment or fixed span.
- 312.04 Signal governing movements over movable bridge protected by interlocking can display aspect to proceed with the track rail on the movable span more than three-eighths inch from correct alinement with the rail seating device on the bridge abutment or fixed span.
- 312.05 Emergency bypass switch or device not locked or sealed.
- 236.314 Electric lock for hand-operated switch or derail.

This rule requires each hand-operated switch or derail within interlocking limits where train speeds exceed 20 miles per hour be electrically locked. At manually operated interlocking it shall be controlled by the operator of the machine. Approach or time locking shall be provided.

Application:

Applies to interlocking only. Applies to all hand-operated switches and derails in interlocking limits where speeds exceed 20 miles per hour.

Applies to each electric lock applied to a hand-operated switch or derail installed under provisions of 236.301 regardless of speed.

Approach or time locking must be provided for each electrically locked switch or derail regardless of speed.

RULE 136.314

The 1939 rules required:

INTERLOCKING

Standards

310. Electric switch locking shall be provided, except when otherwise authorized by the Commission.

The present rule adopted in 1950 reads:

SUBPART C, INTERLOCKING

Standards

136.314 Electric lock for hand-operated switch or derail.--
Electric lock shall be provided for each hand-operated switch or derail within interlocking limits, except where train movements are made at not exceeding 20 miles per hour. At manually operated interlocking it shall be controlled by operator of the machine and shall be unlocked only after signals governing movements over such switch or derail display aspects indicating stop. Approach or time locking shall be provided.

NOTE.- Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

In the notice of proposed rule making in this matter it was proposed to change the body of this rule only by inserting the phrase "within interlocking" in lieu of the present term "within interlocking limits." However, in informal conference all parties agreed to withdraw this change and to retain the present rule insofar as the rule itself is concerned. They do, however, propose dropping the first sentence in the present footnote, so that the entire section as now proposed would read as follows:

136.314 Electric lock for hand-operated switch or derail.--
Electric lock shall be provided for each hand-operated switch or derail within interlocking limits, except where train movements are made at not exceeding 20 miles per hour. At manually operated interlocking it shall be controlled by operator of the machine and shall be unlocked only after signals governing movements over such switch or derail display aspects indicating stop. Approach or time locking shall be provided.

Note.-Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

Since this rule is not to be changed in its substance and since all parties to this proceeding concur in the inclusion of a general provision, applicable to all the rules, to the effect that individual relief may be granted upon an adequate showing, there is no real area of disagreement on this rule. Accordingly it shall be continued as suggested without the first sentence of the footnote.

CLASSIFICATION OF DEFECTS

- 314.01 Electric lock not provided for hand-operated switch or derail within interlocking limits. (Does not apply where train movements are made at speeds not exceeding 20 m.p.h.)
- 314.02 Electric lock on hand-operated switch or derail at manually operated interlocking not controlled by operator of the machine.
- 314.03 Electric lock on hand-operated switch or derail within interlocking limits can be unlocked before signals governing movements over such switch or derail display aspects indicating stop.
- 314.04 Approach or time locking not provided for electric lock on hand-operated switch or derail within interlocking limits.
- 314.05 Electric lock on hand-operated switch or derail within interlocking limits can be unlocked before the expiration of the predetermined time interval, where time locking is provided.
- 314.06 Electric lock on hand-operated switch or derail within interlocking limits can be unlocked before the expiration of the predetermined time interval, with approach section occupied, where approach locking is provided.
- 314.07 Approach or time locking of electric lock at hand-operated switch or derail can be defeated by the unauthorized use of emergency device which is not kept sealed in the non-release position.
- 314.08 Approach locking not effective.
- 314.09 Time locking not effective.

Rules and Instructions

- 236.326 Mechanical locking removed or disarranged; requirements for permitting train movements through interlocking.

This rule prescribes the procedures for train operation through interlocking when the mechanical interlocking is being changed or is removed from the machine, or locking becomes disarranged or broken.

Application:

The procedures prescribed by this rule apply when mechanical locking is being modified, is broken and during repairs, becomes disarranged and is inoperable or uncertain in its operation, is being replaced by electric circuits and for those occasions when interlocking is destroyed by fire, derailment or storm.

When mechanical locking is inoperable, equivalent protection may be provided by electric locking or electric circuits. If such equivalent protection is not provided, each switch, movable point frog or derail in the route must be spiked, clamped or blocked in proper position before train movement is permitted, such movement not to exceed restricted speed. It is not necessary to spike, clamp or block each switch, movable point frog, or derail if protection is provided in accordance with 236.303 and control circuits are arranged to prevent display of aspects more favorable than "proceed at restricted speed."

CLASSIFICATION OF DEFECTS

- 326.01 Train movement permitted through interlocking while mechanical locking of interlocking machine is being changed or is removed, or when locking is disarranged or broken, without each switch, movable point frog, and derail in route over which movement is made being spiked, clamped, or blocked so that it cannot be moved by its controlling lever. (Does not apply if protection equivalent to mechanical locking is provided by electric locking or electric circuits or where protection is in service in accordance with section 303 of the Rules, Standards and Instructions for all signal aspects, and signal controls are arranged so that the signals cannot display an aspect the indication of which is less restrictive than "Proceed at restricted speed.")
- 326.02 Train movement exceeds restricted speed through interlocking while mechanical locking of interlocking machine is being changed, is removed from the machine, or is disarranged or broken.

236.327 Switch, movable point frog or split point derail.

This rule requires that lock rod of switch, movable point frog or split point derail be so adjusted that locking is prevented when the switch point is obstructed by three-eighths inch obstruction.

Application:

Applies to both interlocking and traffic control systems.

Applies to power-operated or mechanically-operated switches, movable-point frogs and derails

Test should be made by placing three-eighths inch obstruction back from the point of switch between point and stock rail and operating switch until slide bar strikes lock rod.

Section 236.327 Switch, movable-point frog or split-point derail.

Section 136.4, paragraph 4, of the 1939 rules required: "Switch shall be so maintained that it cannot be locked when one-fourth-inch rod is placed between stock rail and switch point 6 inches back from the point of switch. Locking edges shall be kept square."

The revision of the rules in 1950 relaxed the requirements. The one-fourth inch was changed to a three-eighths inch and the requirements, concerning locking edges being square, were dropped from the rule.

The parties agree that the present requirements of this rule are reasonable and should be retained. However, they feel that the language of the rule should be revised to omit the reference to an "obstruction" of the switch point. The FRA agrees. In the interest of clarity, the FRA proposes to omit the word "obstruction" and to make it abundantly clear that this rule only applies to switches, movable-point frogs, or split-point derails that are equipped with lock rods since not all switches are so equipped. The FRA's inspectors will test this adjustment by placing an obstruction 6 inches back from the point of switch and operating the switch-and-lock movement until the slide bar strikes the lock rod.

CLASSIFICATION OF DEFECTS

327.01 Switch, movable point frog, or split point derail can be locked when switch point is open three-eighths inch.

236.328 Plunger of facing-point lock.

This rule requires that plunger of lever operated facing-point lock have at least 8 inch stroke and, when unlocked, clear the lock rod not more than one inch.

Application:

Applies to both interlocking and traffic control systems.

Applies only to mechanically operated facing point lock. Does not apply to hand-operated switch machines.

RULE 136.328

In 1939 the rules required:

INTERLOCKING

Rules and Instructions

332. Plunger of facing point lock shall have at least 8 inch stroke and when its lever is in normal position the ends of plunger shall clear lock rod 1 inch. The end of the plunger shall have square edges.

This was changed in 1950 to the following:

SUBPART C, INTERLOCKING

Rules and Instructions

136.328 Plunger of facing point lock. Plunger of facing point lock shall have at least 8-inch stroke. When lever is in reverse position plunger shall pass through lock rod one-half inch or more.

The rule now proposed reads, with changes underlined:

136.328 Plunger of facing point lock. Plunger of lever operated facing point lock shall have at least 8-inch stroke. When lock lever is in unlocked position the end of the plunger shall clear the lock rod not more than one inch.

In the Bureau's observations and dealings with the industry since 1939 it has now come to the conclusion that the 1939 rule is preferable to the 1950 rule, and so it decided to propose revision to the original rule with minor changes. The original rule required that the end of the plunger should clear the lock rod by exactly one inch, but since it is not practicable to maintain this distance so accurately this requirement has been changed from exactly one inch to not more than one inch. The rule as presently proposed omits all reference to the lever in reverse position, as in the present rule, and like the original rule is concerned only with the lever

in normal or unlocked position, which is a more practicable way of stating the requirements. All parties to this proceeding concur in the proposed revision of this rule. It appears in the best interest of all concerned as well as in the interest of safety, and accordingly it shall be revised as proposed.

CLASSIFICATION OF DEFECTS

- 328.01 Stroke of plunger of facing-point lock less than 8 inches.
- 328.02 End of lock plunger clears lock rod more than one inch when lock lever is in unlocked position.

236.329 Bolt Lock.

This rule requires that bolt lock be so maintained that governing signal over a switch or derail cannot display an aspect to proceed unless derail is in non-derailing position and switch is within one-half inch proper position.

Application:

Applies to mechanically operated signal governing movements over switch or derail equipped with bolt lock.

CLASSIFICATION OF DEFECTS

- 329.01 Bolt lock does not prevent signal from being operated to display an aspect less restrictive than "Stop" while derail is in derailing position.
- 329.02 Bolt lock does not prevent signal from being operated to display an aspect less restrictive than "Stop" when switch point is open one-half inch or more.
- 236.330 Locking dog of switch-and-lock movement.

This rule requires that locking dog of switch and lock movement extend through lock rod one half inch or more in either normal or reverse position.

Application:

Applies to both interlocking and traffic control systems.

Applies to mechanically locked switch and lock movements and to switch and lock movements in power operated switch machines.

Holes and notches in lock rod should have square edges to prevent forcing locking dog or plunger into lock rod.

CLASSIFICATION OF DEFECTS

330.01 Locking dog of switch-and-lock movement extends through lock rod less than one-half inch in normal or reverse position.

236.334 Point detector.

This rule requires that point detector be so maintained that contacts cannot be opened by manually applying force at the closed point when switch is locked in either normal or reverse position. Its circuit controller contacts shall not assume the position corresponding to switch point closure if the switch point is prevented by an obstruction from closing to within one-fourth inch where latch-out device is not used and three-eighths inch where latch-out device is used.

Application:

Applies to power-operated switches only in both interlocking and traffic control systems.

Where carriers maintain lock rods to obstruct on one-fourth inch obstruction it may be necessary to either loosen the lock rod or displace point detector rod in order to test the point detector contact adjustment.

Lateral force should be applied to the closed switch point to determine if contacts can be opened because of excessive size notch in lock rod, loose lock rod connections or improper point detector rod adjustment.

The inspector should determine latch-out device is properly adjusted and functioning within prescribed limit. If latch-out is not connected or functioning properly, point detector adjustment must comply with one-fourth inch requirements.

CLASSIFICATION OF DEFECTS

334.01 Point detector contacts can be opened by manually applying force at the closed switch point when switch mechanism is locked in normal or reverse position.

- 334.02 Point detector circuit controller contacts assume the position corresponding to switch point closure when switch point is prevented by an obstruction from closing to within one-fourth inch. (Applies only to point detector where latch-out device is not used.)
- 334.03 Point detector circuit controller contacts assume the position corresponding to switch point closure when switch point is prevented by an obstruction from closing to within three-eighths inch. (Applies only to point detector where a latch-out device is used.)
- 236.335 Dogs, stops and trunnions of mechanical locking.

This rule requires that driving pieces, dogs, stops and trunnions be rigidly fastened to locking bars, that swing dogs have full and free movement and that top plates be securely fastened in place.

Application:

Applies to mechanical locking only.

Do not apply to locking of switch machines.

Mechanical locking cabinets should be opened to fully expose locking and close inspection made to assure compliance.

The floor of interlocking machine cabinets should be closely observed for parts that have fallen from locking; screws, rivets, shavings, chips, and other evidence of poor maintenance or abuse of locking.

CLASSIFICATION OF DEFECTS

- 335.01 Driving piece not rigidly secured to locking bar.
- 335.02 Dog not rigidly secured to locking bar.
- 335.03 Stop not rigidly secured to locking bar.
- 335.04 Trunnion not rigidly secured to locking bar.
- 335.05 Swing dog does not have full or free movement
- 335.06 Top plate not secured in place.

236.336 Locking bed.

This rule requires that various parts of the locking bed, locking bed supports, and tappet stop rail shall be rigidly secured in place and alined to permit free operation of locking.

Application:

Locking bed must be securely fastened in place for proper operation.

CLASSIFICATION OF DEFECTS

- 336.01 Locking bed parts or supports or tappet stop rail not rigidly secured in place.
- 336.02 Locking bed parts or supports or tappet stop rail not alined to permit free operation of locking.
- 236.337 Locking faces of mechanical locking; fit.

This rule requires locking faces fit squarely against each other when locked with minimum engagement of at least one-half the designed locking face.

Application:

Apply this rule to broken or badly worn locking pieces, dogs, tappets and cross locking.

Some cross locking may require removal of cover plates for inspection.

CLASSIFICATION OF DEFECTS

- 337.01 Locking faces do not fit squarely against each other.
- 337.02 Locking faces fit with a minimum engagement when locked of less than one-half the designed locking face.
- 236.338 Mechanical locking required in accordance with locking sheet and dog chart.

This rule requires that mechanical locking in service be in accordance with locking sheet and dog chart.

Application:

Rule 236.1 requires locking sheet and dog chart to be kept at mechanical interlocking and be correct and legible. Locking should be carefully examined to determine compliance with locking sheet and dog chart.

Most mechanical locking, being old, has been altered. Locking that is no longer in service is not required to be removed from locking bed and not required to be shown on locking sheet and dog chart.

CLASSIFICATION OF DEFECTS

338.01 Mechanical locking not in accordance with locking sheet and dog chart currently in effect.

236.339 Mechanical locking, maintenance requirements.

This rule requires that locking and connections be maintained so that motion of levers or latches, when locked, do not exceed prescribed tolerances.

Application:

Mechanical Machine:

More than 90% of mechanical interlocking machines installed were of two types: Saxby and Farmer and Style A. Both have latch operated locking. They are easily recognizable in that S&F machines have rocker arms that stand above the quadrants and Style A machines have rocker arms that stand below the quadrants. Other latch operated machines are dwarf S&F, Johnson and National.

When locked, the latch block of each lever may not be raised so that the bottom thereof is within three-eighths inch of top of quadrant.

The balance of the machines installed have lever operated locking. The majority of these were Style C and Stevens which are almost identical, and dwarf machines other than S&F. These machines are easily recognizable by the absence of rocker arms.

When locked, the lever latch block may not be moved more than the three-eighths inch on top of the quadrant.

Electromechanical Machine:

Electromechanical machines are combinations of electric machines and mechanical machines. The electric machine levers are located above the mechanical levers and are usually Model 14, Model 2, Model 5 or Style S-8 type machines which control electrical circuits and which operate miniature type locking to release or lock the mechanical levers.

When locked, electric levers operating in horizontal plane may not be moved more than five-sixteenths inch in normal position or more than nine-sixteenths inch in reverse position.

When locked, electric levers moving in an arc may not be moved more than five degrees.

When locked, the mechanical levers must comply with requirements for mechanical machines.

Power Machine:

At some large manual interlockings power (electric) interlocking machines manufactured by the Federal Railway Signal Company were installed. These machines are a miniature Type S&F mechanical machine with dwarf type of S&F locking with latch locking. When locked, the latch block of each lever may not be raised so that the bottom thereof is within seven thirty-seconds inch of top of quadrant.

The majority of power interlocking machines installed at large manual interlockings were Model 2, Model 14, and Model 5. At small interlockings, Style TC and Type A table interlocking machines are frequently found. Model 2 and Model 5 machines have levers that move in a horizontal plane. The levers of these machines must meet the same requirements as the electric levers of electro-mechanical machines.

RULE 136.339

The 1939 rule reads:

INTERLOCKING

Rules and Instructions

351. When lever or latch which is locked can be moved more than shown below, excessive lost motion shall be removed:

- (1) Mechanical machine.
 - 1. Latch-operated locking. When lever latch block can be raised to within three-eighths inch of top of quadrant.
 - 2. Lever-operated locking. When lever latch block can be moved more than three eighths inch of top of quadrant.
- (b) Elector-mechanical machine.
 - 1. Lever moving in horizontal plane. When lever can be moved more than three-sixteenths inch when in reverse position.
 - 2. Lever moving in arc. When lever can be moved more than 5°.
- (c) Power machine.
 - 1. Latch-operated locking. When lever latch block can be raised to within seven thirty-seconds inch of top of quadrant.
 - 2. Lever moving in horizontal plane. When lever can be moved more than five-sixteenths inch when in normal position or nine-sixteenths inch when in reverse position.
 - 3. Lever moving in arc. When lever can be moved more than 5°.

The present rule reads:

136.339 Mechanical locking, maintenance requirements.--Locking and connections shall be maintained so that, when a lever or latch is mechanically locked, the following will be prevented:

(a) Mechanical machine.

- (1) Latch-operated locking. Raising lever latch block so that bottom thereof is within three-eighths inch of top of quadrant.
- (2) Lever-operated locking. Moving lever latch block more than three-eighths inch on top of quadrant.

(b) Electromechanical machine.

(1) Lever moving in horizontal plane. Moving lever more than three-sixteenths inch when in normal position or more than seven-sixteenth inch when in reverse position.

(2) Lever moving in arc. Moving lever more than 5°.

(c) Power machine.

(1) Latch-operated locking. Raising lever latch block so that bottom thereof is within seven thirty-seconds inch of top of quadrant.

(2) Lever moving in horizontal plane. Moving lever more than five-sixteenths inch when in normal position or more than nine-sixteenths inch when in reverse position.

(3) Lever moving in arc. Moving lever more than 5°.

The only change in the proposed rule is that the allowable motion in (b) (1) would be raised to 5/16 and 9/16 inch, respectively, and there is no need to restate it. These changes have been suggested in order to make the requirements for the electric levers of an electromechanical interlocking machine moving in a horizontal plane, the same as those for the levers of a power machine, which operate in the same manner. There appears to be no reason why the requirements for the same type of levers should not be identical, whether they are in an electromechanical machine or a power machine. The RLEA does not support this change, but neither does it oppose the revision. It shall be revised as suggested.

CLASSIFICATION OF DEFECTS

- 339.01 Lever latch block can be raised so that its bottom is within three-eighths inch of top of quadrant when latch is mechanically locked. (Applies only to mechanical interlocking machine with latch-operated locking.)
- 339.02 Lever latch block can be moved more than three-eighths inch on top of quadrant when lever is mechanically locked. (Applies only to mechanical interlocking machine with lever-operated locking.)
- 339.03 Lever which is mechanically locked in normal position can be moved more than five-sixteenths inch. (Applies only to electromechanical interlocking machine with levers moving in a horizontal plane.)
- 339.04 Lever which is mechanically locked in reverse position can be moved more than nine-sixteenths inch. (Applies only to electromechanical interlocking machine with levers moving in a horizontal plane.)
- 339.05 Lever which is mechanically locked can be moved more than 5 degrees. (Applies only to electromechanical machine with levers moving in an arc.)
- 339.06 Lever latch block can be raised so that its bottom is within seven thirty-seconds inch of top of quadrant, when latch is mechanically locked. (Applies only to power interlocking machine with latch-operated locking.)
- 339.07 Lever which is mechanically locked in normal position can be moved more than five-sixteenths inch. (Applies only to power interlocking machine with levers moving in a horizontal plane.)
- 339.08 Lever which is mechanically locked in reverse position can be moved more than nine-sixteenths inch. (Applies only to power interlocking machine with levers moving in a horizontal plane.)
- 339.09 Lever which is mechanically locked can be moved more than 5 degrees. (Applies only to power interlocking machines with levers moving in an arc.)

236.340 Electromechanical interlocking machine; locking between electrical and mechanical levers.

This rule requires that locking between electric and mechanical levers of electro-mechanical interlocking machine be maintained so that mechanical lever cannot be operated except when released by electric lever.

Application:

The mechanical levers operate switches, movable point frogs and derails and must be locked by the electric levers.

CLASSIFICATION OF DEFECTS

340.01 Locking between electric and mechanical levers of electromechanical interlocking machine not effective to prevent operation of mechanical lever without being released by electric lever.

236.341 Latch shoes, rocker, links, and quadrants.

This rule requires that latch shoes, rocker links, and quadrants of S&F machines be maintained so that locking will not release when a downward force not exceeding a man's weight is exerted on the rocker with the lever in mid-stroke position.

Application:

Care should be exercised when making this test. Rocker arms are cast metal and can easily be broken with lever in mid-stroke position. A cracked rocker arm or worn linkage will release the locking.

CLASSIFICATION OF DEFECTS

341.01 Mechanical locking of Saxby and Farmer Interlocking machine releases when a downward force not exceeding a man's weight is exerted on rocker while lever is in mid-stroke position.

236.342 Switch circuit controller.

This rule requires that switch circuit controller connected at the point to switch, derail, or movable point frog be maintained to that its

contacts will not be in position corresponding to switch point closure when point is open one-fourth inch or more in either normal or reverse position.

Application:

Applies to both interlocking and traffic control systems.

Apply this rule where switch circuit controller is connected to spring switch, to pipe connected switch, derail, or movable point frog, and where external circuit controller is added to power operated switch.

CLASSIFICATION OF DEFECT

- 342.01 Contacts of switch circuit controller connected at the point to switch, derail, or movable point frog are in position corresponding to switch point closure when switch point is open one-fourth inch or more.

INSPECTIONS AND TESTS

- 236.376 Mechanical locking.

This rule requires testing of mechanical locking when new locking is installed, when there is a change in locking or when locking is restored after being disarranged. It requires a complete test of all mechanical locking at least once every two years.

Application:

Mechanical locking tests should be made by establishing a route and trying all conflicting signal control levers before pulling the signal lever. The signal lever should then be pulled. This should lock out all opposing and conflicting route lineups and prevent the movement of any lever in the route lined up.

On levers equipped with electric locks the lock should be deenergized and the latch rattled and

moved around to see that it is mechanically impossible to release the lock.

Test should be made to insure that levers equipped with electric locks mechanically lock all levers previously operated in that lineup.

Check shall be made to determine that the locking is in accordance with the locking sheet and dog chart as required by Rule 236.338.

Test should not be made when the route has been cleared for a rail movement or if rail traffic is within the route or a conflicting route.

Compliance with rules Nos. 236.326, 236.335, 236.336, 236.337, 236.338, 236.339, 236.340, and 236.341 is required.

Section 236.376 Mechanical locking.

The provisions of this section have remained unchanged since the original 1939 rules were adopted. Only editorial changes were made in 1950.

These provisions are applicable to mechanical interlocking machines. The FRA notes that the present technology of the railroad industry makes the installation of mechanical interlocking uneconomical. No new mechanical interlockings have been installed in the last several years, and the average age of such interlockings is approaching 60 years. The locking beds and mechanical parts of these interlockings are becoming worn and no longer meet the manufacturers' original specifications. The 1939 and 1950 rules dealt with the testing of mechanical interlockings in relatively good condition, while the present rules must deal with the devices near the end of their effective use. In the interest of economy, efficiency and safety, the FRA recommends this old, antiquated equipment should be tested more frequently and proposed to the parties that the test period be lowered to 2 years on mechanical interlocking machines. The parties agree with the FRA. Therefore, the FRA proposes to revise this section to the extent mechanical locking shall be tested when locking is installed, a change is made, locking becomes disarranged or at least once every two years.

CLASSIFICATION OF DEFECTS

- 376.01 Mechanical locking of interlocking machine not tested when new locking is placed in service.
- 376.02 Mechanical locking not tested when change in locking is made.
- 376.03 Mechanical locking not tested when restored after being disarranged.
- 376.04 Complete test of mechanical locking in interlocking machine not made at least once every two years.

236.377 Approach locking.

This rule requires that approach locking be tested when installed, modified or disarranged and at least once every two years thereafter.

Application:

Applies to both interlocking and traffic control systems.

Tests shall not be made if any route has been cleared for rail movement or if rail movement is within route to be tested or conflicting route.

Manual interlocking and controlled point.

Each track section within the limits of the approach circuit shall be shunted and inspection made to determine that the approach relay is deenergized by each shunt.

Signal shall then be cleared by regular operation and shunt placed in approach section or approach relay deenergized. Signal shall then be restored to its stop indication and inspection made to determine that timing relay, if provided, is energized. Each switch, movable point frog, derail, or electrically locked switch in route governed shall be tried to insure their positions cannot be changed or a conflicting signal established during the timing relay's predetermined time interval.

Where time release must be operated, each switch, movable point frog or derail must be tried to insure their positions cannot be changed or conflicting signal established both prior to operation of time release and after its operation during its predetermined time interval.

Test each route governed by each signal.

Automatic interlockings:

Each track section within the limits of the approach circuit shall be shunted and inspection made to determine that the approach relay is deenergized by each shunt.

Clear home signal by placing a shunt in the approach section or opening approach circuit. Then place a shunt in the approach section or open the approach circuit of a conflicting route. Then operate the time release or push button for the conflicting route and determine that the home signal is restored to its stop indication and the conflicting route is not established until after the prescribed predetermined time interval.

Some automatic interlockings have superior routes that, when the approach section is occupied, causes cleared conflicting signals to display stop indication and timing relay to operate, and, after expiration of the predetermined time interval, clears the signal governing the superior route. Some automatic interlockings have inferior routes that, when the approach section is occupied and home signal cleared, timing relay begins operating and, after the expiration of the predetermined time interval, restores the home signal to its stop indication. Regardless of the arrangement, changeover shall not occur until after the expiration of the prescribed predetermined time interval.

236.377 Approach locking.

The requirement that approach locking be tested once each year was contained in the 1939 rules and remained unchanged in the 1950 rules. The rule was written to require testing of approach locking of mechanical, electro-mechanical and electric interlockings.

Approach locking is achieved by electrical circuits which will continue to give satisfactory performance unless the circuits are modified, disarranged or interfered with. The test period of one year can be extended to two years without a reduction in safety, but approach locking needs to be tested when installed or when circuit changes are made, and a definite need exists for a periodic test to assure continued safety. The FRA has proposed, and the parties have agreed, that the rule be so revised.

CLASSIFICATION OF DEFECTS

- 377.01 Approach locking not tested when installed, modified, or after being disarranged.
- 377.02 Approach locking not tested at least once every two years.
- 236.378 Time Locking.

This rule requires time locking to be tested when installed, modified, or disarranged and at least once every two years thereafter.

Application.

Applies to interlocking and traffic control systems.

Test should not be made if any rail traffic is approaching or within route or conflicting routes.

Test shall be made by clearing a signal by regular operation. The signal shall then be restored to its stop indication and check made to determine timing device, if provided, is energized. Each switch, movable point frog, derail or electrically locked switch in route governed shall be tried to insure their positions cannot be changed or a conflicting signal established during the predetermined time interval.

Where time release must be operated, the above units must be tried both prior to operation of time release and after its operation during its predetermined time interval.

Section 236.378 Time locking.

The testing requirements for time locking have not changed since 1939. These provisions require testing of time locking at mechanical, electro-mechanical and electric interlockings at least once each year. Time locking may be achieved either electrically or mechanically. The record shows that time locking is not subject to frequent failure, and seldom are defective conditions detected in routine tests of time locking. However, there is a definite need to test time locking when it is installed, when circuits are modified or for some reason disarranged. In the interest of safety, a periodic test also needs to be made to continually monitor the condition of the vital locking circuits of all interlockings.

The test period of one year can be extended to two years without a reduction in safety. In the interests of safety and also to make this rule more cost effective, the FRA has proposed, and the parties have agreed, to the proposed revisions.

CLASSIFICATION OF DEFECTS

378.01 Time locking not tested when installed, modified, or after being disarranged.

378.02 Time locking not tested at least once every two years.

236.379 Route locking.

This rule requires that route or any other type of switch locking be tested when installed, modified, or disarranged and at least once every two years thereafter.

Application:

Applies to both interlocking and traffic control systems.

Tests should not be made if rail traffic is approaching or within route to be tested or conflicting routes.

Test shall be made for all mechanical or power-operated switches and hand-operated electrically locked switches or derails that are locked in both the reverse and normal position.

Test shall be made by clearing signal for an established route after which each track circuit within the route shall be progressively shunted beginning with the first track circuit in advance of the signal. While each track circuit is shunted, each switch, movable point frog, derail and facing point lock lever in the route shall be tried to insure their positions cannot be changed.

The rule permits sectional release locking that will release the locking of switches, movable point frogs, derails and facing point lock levers in the rear of the progressive shunt. Inspection shall be made to determine that as each section is released, a route cannot be established that would result in improper clearance between train movements.

Route locking tests shall be conducted over each route governed by each signal and repeated in each route.

Section 236.379 Route locking.

The present rule requires, as follows: "Route or other type of switch locking shall be tested at least once every three months." The requirements of the present rule have remained unchanged since 1939 except for the making of mere editorial changes.

When the original rules were adopted, route locking was achieved by mechanical means (detector bars) as well as by using electrical circuits. Mechanical locking was subject to wear and needed frequent testing and adjustment. Route locking is now achieved by electrical circuits and electromagnetic devices such as electric locks on levers of mechanical interlockings. These electrical circuits and electro-magnetic devices will continue to function as intended until such time as changes are made in the circuits or they are disturbed in some manner.

The FRA recognizes the unnecessary testing burden placed on the industry and proposes to change the requirements of this rule to relieve this burden of making such unnecessary tests but to also retain the intended safety.

The parties also agree that such changes should be made.

CLASSIFICATION OF DEFECTS

- 379.01 Route or other type of switch locking not tested when installed, modified, or after being disarranged.
- 379.02 Route or other type of switch locking not tested at least once every two years.
- 236.380 Indication locking.

This rule requires that indication locking be tested when installed, modified, or disarranged and at least once every two years thereafter.

Application.

Applies to both interlocking and traffic control systems.

Indication locking for signals:

Home and approach signals shall be cleared by means of regular operation. Where a separate relay repeating only the red and yellow indications of the approach signal is used, visual check shall be made to insure that the clearing of the approach signal causes such relay to become deenergized. Where such relay is not used, then a voltmeter shall be connected to the control wire for the indication lock at a point between the home and approach signals (line arrestors) to insure that the clearing of the approach signal removes energy from such wire. Where two or more approach signals are involved, test must be made to insure that the clearing of each one of the approach signals accomplishes this result.

After this part of the test has been completed, the approach signal shall be set in its restrictive position by opening its control circuit and then with the home signal clear, a visual check shall be made to insure that the indication lock on

the signal lever or lock lever is properly deenergized, or in the case of all relay type locking, that the lock relay is deenergized.

Next, disconnect a coil wire of the home signal red repeater relay or lock relay or open the control wire of the indication lock where the meter reading was previously taken and then restore the home signal to stop indication. Visual check shall then again be made to insure that indication lock or lock relay is deenergized.

After above tests are made to insure that the clearing of either the home or approach signal deenergizes the indication lock or lock relay, test shall be made to insure that switches, derails, and movable point frogs in route cannot be changed and that conflicting signal cannot be obtained.

The test is then completed, where indication lock is used on a lever, by deenergizing the lock by opening its control circuit at the coil terminal and clearing the home signal. If the lock is on the home signal lever, it shall be tried to insure it cannot be latched full normal. If the indication lock is on a lock lever, the home signal lever shall be placed normal and the lock lever tried to insure that it cannot be unlatched from the reverse position. Where all relay type locking is used, open lock circuit at each signal control relay or red repeater relay and visually check to insure the lock relay becomes deenergized. At automatic interlocking, proceed as above except check stick locking circuits in lieu of indication locking circuits.

Where signals are of the semaphore type, visual inspection must also be made to insure that locking becomes effective with the signal blade not over five degrees above the 45 degree position on upper quadrant approach signals or five degrees below the 45 degree position on lower quadrant approach signal, and not over five degrees from horizontal on home signals.

Indication locking for switches:

Where indication lock is on control lever, with switch in full normal position, the reverse switch point shall be obstructed so that the switch cannot operate full throw. The lever shall then be operated so that the switch will operate against the obstruction and test made to insure lever cannot be latched reverse with the switch unlocked.

Where all relay type locking is used, the above method of obstruction and switch operation shall be followed and visual check made to insure indication light on control panel remains unlighted and trial made to insure signals governing movements over the switch cannot be cleared.

Above tests shall be made for both the normal and reverse positions of each switch.

Section 236.380 Indication locking.

The present rule adopted in 1950 requires: "Indication locking for semaphore signals and for switch or lock levers shall be tested at least once a year and for light signals at least once every two years."

Similar testing requirements were contained in the 1939 rules and the need for such testing is still valid.

However, the industry has improved its design of signal systems over the years and no longer installs semaphore signals or mechanically locked switch or lock levers. The mechanical interlocking machines still in service will be tested more frequently than heretofore under proposed section 236.376.

Indication locking achieved by all electric locking circuits is not subject to wear of mechanical locking parts. Such electric locking will continue to function as intended until the circuit is modified or disarranged in some manner. The parties agree the rule should be relaxed to the extent that indication locking be tested every two years but would require additional tests if the circuit is changed or disturbed.

After thoroughly considering this suggested change, the FRA proposes this revision be adopted.

CLASSIFICATION OF DEFECTS

380.01 Indication locking not tested when installed, modified, or after being disarranged.

380.02 Indication locking not tested at least once every two years.

236.381 Traffic locking.

This rule requires that traffic locking be tested when installed, modified, or disarranged and at least once every two years thereafter.

Application:

Applies only to interlockings.

Tests should not be conducted if rail traffic is approaching or within the route to be tested.

Tests shall be performed by clearing signal governing entrance to the traffic block and checking that traffic levers cannot be changed or opposing signal cleared until signal is restored to "Stop" position and approach or time locking released. Drop each track relay in the traffic block section and see that traffic lever cannot be moved, direction of traffic changed, or opposing signal cleared.

Section 236.381 Traffic locking.

Adopted in 1950 the present rule reads: "Traffic locking shall be tested at least once a year."

This testing requirement was first adopted in 1939 and at that time applied for the most part to electrically locked mechanical interlocking levers or locking within the mechanical interlocking machine.

Mechanical or electro-mechanical traffic locking is no longer installed and is being replaced by the industry with electrical circuits as conditions dictate. The electric traffic locking circuits do not have mechanical components that wear or break, but will continue to function as intended until the circuit is changed or disrupted in some manner. The FRA proposes to revise this rule by inserting language identical to that used in the previous three sections.

CLASSIFICATION OF DEFECTS

- 381.01 Traffic locking not tested when installed, modified, or after being disarranged.
- 381.02 Traffic locking not tested at least once every two years.
- 236.382 Switch obstruction test.

This rule requires that a switch obstruction test be made when lock rod is installed and at least once a month thereafter.

Application:

Applies to interlocking and traffic control systems.

Test should not be conducted if rail traffic is approaching or within the route to be tested.

This rule applies to mechanical switches, electric switches, and electro-pneumatic switches. It does not apply to hand-operated switches without switch-and-lock-movements.

A three-eighths inch obstruction should be placed six inches behind the switch point and an attempt made to lock the lock rod.

Section 236.382 Switch obstruction test.

The 1939 rules required the following: "Switch obstruction test shall be made quarterly to ensure proper maintenance and adjustment of switches."

The 1950 revision of the rules resulted in the present rule which reads as follows: "Switch obstruction test shall be made at least once a month."

It has been suggested that a safety void exists because no test is required at the time a lock rod is installed. The FRA has considered the suggested revision and proposes that the rule be revised to provide for switch obstruction testing of lock rods when installed and at least once a month thereafter.

CLASSIFICATION OF DEFECTS

382.01 Switch obstruction test not made when lock rod installed.

382.02 Switch obstruction test not made at least once each month.

236.383 Valve locks and valve magnets.

This rule requires that valve locks on valves of the non-cutoff type be tested at least once every three months and valves and valve magnets be tested at least once every year.

Application:

This rule applies to interlocking and traffic control systems. Tests should not be conducted while rail traffic is approaching or within the route of the tests.

Test shall be conducted by removing valve stem or control wire from lock magnet of electro-pneumatic switch. Switch should not move.

Where "CP" valves are used, place switch lever normal, close globe valve and remove plug in reverse side of switch cylinder, then move lever to reverse indicating point. Indication should not be received when lever is moved to reverse. Restore plug and open globe valve, reverse switch, and repeat test.

Test "D" valve of non-cutoff type in normal and reverse positions by removing armature stem in lock valve magnet and operating controlling lever; switch should not respond.

Test each set of cutoff valves with switch in normal position by holding lock and reverse armature in for about one minute while normal magnet is energized; switch should not respond. Repeat in reverse position, holding lock and normal armatures while reverse magnet is energized.

Section 236.383 Valve locks, valves and valve magnets.

Adopted in 1950, the present rule has the same testing requirements that was provided in the original 1939 rules. The revision of 1950 merely edited the rule's language for the sake of brevity.

The present rule reads: "Valve locks on valves of the non-cut-off type, valves and valve magnets shall be tested at least once every three months."

In considering this rule, the FRA notes that the valve lock on the non-cut-off type is an internal mechanical lock which serves a vital safety function to prevent the pneumatic switch from being operated beneath the wheels of a train. The valves and valve magnets themselves are a different matter. Should they fail to function the switch simply will not operate. Further, the C valve of the non-cut-off type has been replaced with the modern CP valve which does not have this internal mechanical arrangement.

In the interest of making these requirements more cost effective but consistent with safety, the FRA proposes that valve locks of the cut off type still be tested once every three months but that testing of valves and valve magnets be tested at least once every year.

CLASSIFICATION OF DEFECTS

383.01 Valve lock in electropneumatic interlocking not tested at least once every three months. (Applies only to valves of the non-cutoff type.)

383.02 Valve in electropneumatic interlocking not tested at least once every year.

383.03 Valve magnet in electropneumatic interlocking not tested at least once every year.

236.384 Cross protection.

This rule requires that cross protection be tested at least once every six months.

Application:

This rule applies only to interlockings provided with cross protection devices. Tests should not be conducted while rail traffic is approaching or within the section of interlocking to be tested.

This test insures that switches, signals, etc., do not respond when current is improperly applied to circuits. It is recommended that a variable resistor be used in making the test.

Tests should be made when plant voltage is at the maximum.

Make temporary connection between normal and reverse operating wires for each switch at the pole changer. This should open polar relay or circuit breaker.

Make temporary positive battery connection from the nearest switch to the signal control wire as close as practicable to the signal motor. This should open the polar relay or circuit breaker.

If the signal control circuit is connected to the common return wire through one or more switch circuit controllers, the energy should be applied to this wire, first opening the connection to the main common to prevent blowing fuse in the switch circuit. If plant is sectionalized, one

or more functions in each section should be crossed with wires taking energy from each of the other sections. In case functions in various sections are too widely separated, the temporary crosses can be made between the binding posts on the terminal board of the interlocking machine. This should open the section breakers.

Section 236.384 Cross protection.

The present rule reads: "Cross protection shall be tested at least once every three months."

The testing requirements of this rule were included in the 1939 rules. The 1950 revisions edited the previous rule for brevity and defined cross protection in the definitions. This rule applies to only those interlockings that are provided with an arrangement to prevent the movement of switches, signals or other signal appliances as the result of a cross in the electrical circuits.

FRA previously proposed in this NPRM to require ground tests every three months (proposed new section 236.107), and the parties feel it is no longer necessary to test cross protection as frequently if the new ground test requirement is adopted. Therefore, the parties recommend that the test period be extended from every three months to every six months. The FRA concurs and proposes the change be adopted.

CLASSIFICATION OF DEFECTS

384.01 Cross protection not tested at least once every six months.

236.386 Restoring feature on power switches.

This rule requires that restoring feature on power switches be tested once every three months.

Application:

Applies to interlocking and traffic control systems. Applies only to electropneumatic switches. Air shall be removed from switch before testing. Test shall be made by using a bar and moving slide bar of switch movement toward opposite position to a point before locking dog disengages lock rod. Restore air to determine that slide bar is driven to original position.

CLASSIFICATION OF DEFECTS

386.01 Restoring feature on power switch not tested at least once every three months.

236.387 Movable bridge locking.

This rule requires movable bridge locking to be tested at least once a year.

Application:

Applies to movable bridge interlockings. Test shall be made by displacing bridge locking members one inch from their proper position and determine that signals are at "Stop".

When movable bridge is equipped with circuit controllers with or without mechanical rail locks, movable rails shall be displaced 3/8" from their correct surface or alignment with adjacent fixed rail by an obstruction. With the movable rail thus displaced, the rail lock should not lock up. This test should be made for each rail lock on the bridge.

Check operation of all circuit controllers connected to the wedges, latches, rail locks, etc., to see that contacts make or break when corresponding functions are in their proper position.

CLASSIFICATION OF DEFECTS

387.01 Movable bridge locking not tested at least once a year.

236.401 Automatic block signal system and interlocking standards applicable to traffic control systems.

This rule prescribes the following automatic block signal system and interlocking standards be applied to traffic control systems:

- 236.201 Track-circuit control of signals.
- 236.202 Signal governing movements over hand-operated switch.
- 236.203 Hand-operated crossover between main tracks; protection.
- 236.205 Signal control circuits; requirements.
- 236.206 Battery or power supply with respect to relay; location.
- 236.303 Control circuits for signals, selection through circuit controller operated by switch points or by switch locking mechanism.
- 236.307 Indication locking.
- 236.309 Loss of shunt protection; where required.
- 236.310 Signal governing approach to home signal
- 236.311 Signal control circuits, selection through track relays, or devices functioning as track relays, and through signal mechanism contacts

and time releases at automatic interlocking.

Application:

The above automatic block signal and interlocking standards apply to traffic control systems.

NPRM
Federal Register
March 21, 1983

Section 236.401 Automatic block signal system and interlocking standards applicable to traffic control systems.

In section 236.309, the FRA proposed that section 236.309 be recaptioned and so revised that loss of shunt protection would be required on the route locking of all power-operated switches hereafter installed and further proposed to revise section 236.401 to make section 236.309 applicable to traffic control systems. Thus, FRA now proposes to revise section 236.401 by adding 236.309 to the other sections presently listed in 236.401.

236.402 Signals controlled by track circuits and control operator.

This standard requires that all home signal aspects more favorable than "proceed at restricted speed" be controlled by track circuit extending through the entire block. At a controlled point the control circuits may be controlled by a control operator and at manually operated interlockings the home signals shall be controlled manually in cooperation with control operator.

Application:

Any aspect more favorable than "proceed at restricted speed" must be selected through track relays regardless of any speed limit or restriction. The aspect and indication determine compliance with this standard, not speed.

A block extends from a signal to the next governing signal or from a signal to the limits or end of the system.

Control circuits do not have to be manually controlled by the operator and may be automatic. However, it is not the intention of this rule to give control to any other individual operation in opposition to or in conflict with the control operator.

RULE 136.402

The 1939 rules required:

CENTRALIZED TRAFFIC CONTROL SYSTEMS

Standards

* * *

405. Signals shall be automatically controlled by continuous track circuits on main tracks and on other tracks where medium speed is permitted, and in addition at controlled point by control operator, and at manually operated interlocking manually in cooperation with control operator.

The present rule reads:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standards

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136.402 Signal control, track circuit and control operator. -- Signals governing movement at higher than restricted speed shall be controlled by continuous track circuits. Also, in addition, at controlled point they shall be controlled by control operator, and, at manually operated interlocking, manually in cooperation with control operator.

As now proposed the rule reads, changes underlined:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standards

* * *

136.402 Signals controlled by track circuits and control operator. -- The control circuits for home signal aspects with indications more favorable than "proceed at restricted speed" shall be controlled by track circuits extending through entire block. Also in addition, at controlled point they may be controlled by control operator, and, at manually operated interlocking, they shall be controlled manually in cooperation with control operator.

This rule is to traffic control systems what rule 136.201 is to automatic block signal systems. These changes are proposed in keeping with certain changes in other rules where the phrase "Signals governing movements at higher than restricted speed" is replaced with the phrase "the control circuits for signal aspects with indications more favorable than proceed at

restricted speed," all intended to prevent circumvention of the over-all requirement through imposition of a below 20 miles per hour speed limit. The insertion of the word, "may" in the second sentence of the proposed rule would allow automatic control of control circuits. It is not intended to give control to any other individual in conflict with the control operator.

The RLEA is apprehensive over the proposed rule partly for the same reasons it is apprehensive over proposed rule 136.201. The scope of the term "home" as it applies to "signal" is the heart of the matter in the RLEA view. In addition, they wish assurance that the proposed rule does not permit someone, some individual, other than the control operator, to control the home signal, and, too, that a situation not develop in which two persons might have control over a given route or territory with each not knowing what the other is doing.

The RLEA repeats, with vigor, its apprehension that the term "home signal" has various loose meanings out in the industry among various employees, though the record shows that no rail carrier defines the term "home signal" in any way inconsistent with the Commission's definition of it, except that the Boston and Maine defines it, to wit: "Home signal, a fixed signal at the entrance to a route or block to govern trains or engines entering or using that route or block." The Boston and Maine defines interlocking signals as "the fixed signals of an interlocking", again varying from the Commission's definition particularly through use of the word "fixed".

In lieu of the proposed rule last listed above, the RLEA would urge the following rule:

136.402 Signals controlled by track circuits and control operator. -- The control circuits for signal aspects with indications more favorable than "stop" shall be controlled by track circuits extending through entire block. Also, in addition, at controlled point they shall be controlled by control operator, and, at manually operated interlocking, manually in cooperation with control operator.

The Bureau points out, however, that the term track circuit control refers to control circuits carried through front contacts of relays, and not back contacts; that this understanding is accepted throughout the industry; and that under this understanding the rule just suggested by the RLEA is not possible of compliance from an engineering viewpoint. It is pointed out that traffic control systems are designed and interlocked in such a manner as to prevent the display of aspects for conflicting movements.

Discussion and Findings - Rule 136.402.

Respecting the insertion of the qualifying term "home" in front of "signal" the same comments apply here as were made concerning rule 136.201. As to the apprehension of the RLEA over use of the word "may" instead of "shall" it is understood here, and

the rule shall be so applied, that the word "may" is used solely to allow for automatic control of signals. It is not and will not be authority for the giving of control to any individual or position in opposition to or conflict with the control operator. In this connection it should be kept in mind as ably pointed out by expert engineers testifying in this manner, that the circuit design of traffic control systems would prevent dual conflicting controls such as referred to by the RLEA. It is found that this rule should be revised as now proposed by the Bureau.

Rule 402

Signals control, controlled by track circuits and control operator. ~~--Signals-governing-movement-at-higher-than-restrictive speed. The control circuits for home signal aspects with indications more favorable than "proceed at restricted speed" shall be controlled by continuous-track-circuits circuits extending through entire block. Also in addition, at controlled point they shall~~ may be controlled by control operator, and, at manually operated interlocking, manually in cooperation with control operator.

On exception, RLEA asserts that two features of the proposed rule need clarification, i. e., the meaning of home signal and the provision whereby signals may be controlled by the control operator. The clarification set forth in our discussion of rule 201 that the term home signal excludes only those signals outside an automatic block signal system applies equally here. RLEA's apprehension over the substitution of "may" for "shall" in the rule is dispelled by the explanatory statement in the examiner's recommended report that:

As to apprehension of the RLEA over the use of the word "may" instead of "shall" it is understood here and the rule shall be so applied that the word "may" is used solely to allow for automatic control of signals. It is not and will not be authority for the giving of control to any individual or position in opposition to or in conflict with the control operator.

We adopt the examiner's explanatory statement as our own and find that the proposed rule should be adopted as modified.

CLASSIFICATION OF DEFECTS

- 402.01 Signal control circuits for home signal aspects more favorable than "proceed at restricted speed" not controlled by track circuits extending through the entire block.
- 402.02 Signal at manually operated interlocking not controlled manually in cooperation with control operator.
- 236.403 Signals at controlled point.

This rule requires signals at a controlled point to be so interconnected that aspects to proceed cannot be displayed simultaneously for conflicting movements, except they may display an aspect indicating "proceed at restricted speed" at the same time on track used for switching movements only.

Application:

Signals at every controlled point must be so interconnected that aspects to proceed cannot be displayed simultaneously for conflicting train movements.

This is a companion rule to 236.308 in that it permits display of aspect indicating "proceed at restricted speed" at the same time on track used for switching movements only by one train at a time.

Section 236.403 Signals at controlled points.

This rule was contained in the 1939 rules as section 136.5(a), (6). The revisions of 1950 made minor editorial changes so that the present rule reads: "Signals at a controlled point shall be so interconnected that those aspects to proceed cannot be displayed simultaneously for conflicting movements."

The parties have agreed to add the following: "except that opposing signals may display an aspect indicating 'proceed at restricted speed' at the same time on a track used for switching movements only,...."

The parties pointed out that the companion rule governing interlockings, section 236.308, has such a provision excepting switching tracks from compliance. The FRA has considered the recommendation and proposes that the rule be revised to be consistent with section 236.308.

CLASSIFICATION OF DEFECTS

- 403.01 Signals at controlled point simultaneously can display aspect to proceed for conflicting train movements. (Does not apply to signals on track used for switching movements only by one train at a time.)
- 403.02 Signals at controlled point on track used for switching movements only simultaneously can display aspect more favorable than "proceed at restricted speed" for conflicting train movements.
- 236.404 Signals at adjacent control points.
- This rule requires that signals at adjacent controlled points to be interconnected that aspects to proceed on tracks signaled for movements at greater than restricted speed cannot be displayed simultaneously for conflicting movements.

Application:

This rule permits restricted speed aspects to be displayed simultaneously for opposing or converging routes at adjacent control points provided the speed restrictions between the control points do not exceed 20 mph. The rule was revised in 1964 primarily to permit restricted speed conflicting movements into a siding from each end. The maximum authorized speed between adjacent controlled points where signals can simultaneously display aspects indicating proceed at restricted speed shall not exceed 20 mph regardless of more favorable aspects displayed and regardless whether or not track is signaled.

RULE 136.404

The 1939 rules required:

CENTRALIZED TRAFFIC CONTROL SYSTEMS

Standards.

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407. Signals at adjacent controlled points shall be so interconnected that they cannot be clear for opposing or conflicting movements.

In 1950 this became:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standards.

* * *

136.404 Signals at adjacent controlled points.--
Signals at adjacent controlled points shall be so interconnected that aspects to proceed cannot be displayed simultaneously for conflicting movements.

In the notice published herein it was proposed to restate this rule as follows:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standards.

* * *

136.404 Signals at adjacent controlled points.--
Signals at adjacent controlled points shall be so interconnected that aspects with indications more favorable than "proceed at restricted speed" cannot be displayed simultaneously for conflicting movements.

A literal interpretation of this rule, as presently worded, would preclude the entering signals at both ends of a controlled siding from simultaneously displaying aspects to proceed at restricted speed into the siding. Soon after this rule went into effect exception was taken to it on the basis that it was intended to apply only to signals governing movements on the main track and into sidings which were signaled, and not to signals which do not display aspects more favorable than "proceed at restricted speed" for movements into a siding, which is not signaled. There was a practical side to this view, and the Bureau has so applied the rule. In other

words, the Bureau has gone along with the view that the entering signals at both controlled ends of a non-signalized siding simultaneously can display aspects to proceed at restricted speed for movements into the siding, without being in violation of Section 136.404. The proposed change was suggested in order to clarify the requirements of Rule 136.404. It was pointed out in informal conference, however, that the revised rule, would permit opposing signals simultaneously to display "proceed at restricted speed" aspects for movements on the main track and on signalized sidings as well as on non-signalized sidings. It has been suggested, therefore, in order to prevent such undesired operation that the rule be further revised to read as follows the underlines indicating the changed portion:

136.404 Signals at adjacent controlled points.--
Signals at adjacent controlled points shall be so interconnected that aspects to proceed on tracks signaled for movements at greater than restricted speed cannot be displayed simultaneously for conflicting movements.

The Bureau considers this an improvement over the proposed revision published in the notice as it more accurately states what the rule is intended to convey.

The RLEA opposes either change to this rule. It points out that under the present rule there is an absolute, clearly stated, positive prohibition against giving proceed aspects to conflicting movements, whereas under the proposed changed conflicting proceed aspects could be given so long as the movements are under 20 miles per hour. To have two opposing trains approaching each other, head-on, each at 20 miles per hour, is inherently a dangerous situation as they see it, particularly in areas of reduced visibility.

The AAR emphasizes, however, that the proposed change in this rule would not authorize conflicting movements on main line fast speed tracks but only on certain yard tracks and siding, that its application is really rather limited, and, to repeat, that it would authorize conflicting movements only on tracks which are so signaled that the maximum authorized speed at any time is restricted speed or less. Discussion and Findings - Rule 136.404. This rule is being drastically changed in its wording but its application over the past 13 plus years has been the same as here proposed. That is, restricted-speed-conflicting operations into the siding, from each end, will be allowed, and literally so, not just tacitly as now. Experience has indicated nothing in the years since 1950 to require changing the actual interpretation and application of the rule, and in the circumstances the examiner finds for its revision as last shown above to correspond with actual practice.

Rule 404

Signals at adjacent controlled points.--
Signals at adjacent controlled points shall be so interconnected that aspects to proceed on tracks signaled for movements at greater than restricted speed cannot be displayed simultaneously for conflicting movements.

Literally applied, the present rule would preclude the entering signals at each end of a controlled siding from simultaneously displaying aspects to proceed at restricted speed into the siding. On exceptions, RLEA urges that exact circumstances in which opposing movements would be permitted under the proposed rule should be specified. Thus, RLEA takes the position that:

An interpretation to this rule should be adopted which would clearly restrict the application of the revised rule to permit opposing movements only on non-signaled sidings in traffic control territory where the maximum authorized speed at any time is restricted speed or less.

In reply, AAR correctly indicates that the rule cannot be restricted to "sidings" because there are non-signaled yard tracks in traffic control territory to which it also applies and that under the proposed rule the same safeguards that extend to sidings also extend to yard tracks.

The proposed rule would not authorize conflicting movements on main-line-fast-speed tracks but only on certain yard tracks and sidings. Moreover, conflicting movements are permitted only on tracks where the maximum authorized speed at any time is at restricted speed or less.

We find the proposed rule should be adopted.

CLASSIFICATION OF DEFECTS

404.01 Signals at adjacent controlled points not so interconnected that aspects to proceed, on tracks signaled for movements at greater than restricted speed, cannot be displayed simultaneously for conflicting movements.

236.405 Track signaled for movements in both directions, change of direction of traffic.

This rule prevents the changing of the direction of traffic from that which was obtained at the time the track was occupied between opposing signals at adjacent controlled points on track signaled for movement in both directions except that when a train having left one controlled point reaches a section of track immediately adjacent to the next controlled point at which switching is to be performed, an aspect permitting movement at not exceeding restricted speed may be displayed into the occupied block.

Application.

After a train or engine has passed an aspect at a controlled point indicating any type of proceed aspect, the opposing signals at the adjacent controlled point shall not display any type of aspect indicating "proceed" as long as the section of track between controlled points is occupied, or while a signal displays an aspect to proceed into that section.

Rule 236.405's exception to the traffic locking requirements applies only in instances when a train is left on the main track while its engine and/or cars move into an adjacent siding or yard for switching purposes and must, in returning to its train, reverse its direction for a short distance. It is permissible in such instances to permit such movements to be made with a signal aspect indicating "proceed not to exceed restricted speed" into the occupied block.

RULE 136.405

In the rules established in 1939 there was a provision as follows:

CENTRALIZED TRAFFIC CONTROL SYSTEMS

Standards

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409. On track signaled for movements in both directions, means shall be provided for establishing, maintaining, and changing direction of traffic.

In 1950 the rule next set forth was established without opposition:

SUBPART D, TRAFFIC CONTROL SYSTEM

Standards

* * *

136.405 Track signaled for movement in both movement in both directions, change of direction of traffic. -- On track signaled for movement in both directions, occupancy of the track between opposing signals at adjacent controlled points shall prevent changing the direction of traffic from that which obtained at the time the track became occupied.

Here is the rule now proposed with the changes underlined:

136.405 Track signaled for movements in both directions, change of direction of traffic. -- On track signaled for movements in both directions occupancy of the track between opposing signals at adjacent controlled points shall prevent changing the direction of traffic from that which obtained at the time the track became occupied, except that when a train having left one controlled point reaches a section of track immediately adjacent to the next controlled point at which switching is to be performed, an aspect permitting movement at not exceeding restricted speed may be displayed into the occupied block.

This rule has been revised to provide for the situation where part of a train is left on the main track or in a siding at a controlled point while the engine proceeds to occupy the track between that siding and the adjacent controlled point to perform switching operations. Under the present rule a signal cannot be displayed for the engine to get back to its train because this would require changing the direction of traffic with the track occupied.

Therefore, instructions have to be issued to permit the engine to move back to its train under a red or stop signal indication. The Commission has received several complaints from railroad employee organizations who objected to this method of operation, but in each case it has been necessary to inform the complainant that under Section 136.405, it is not permissible to authorize, by signal indication, movement of the engine back to its train after performing switching operations. In other words, under the present rule, were a train left standing between a Signal governing movements over a switch and its engine moved westward past the signal into the siding, and subsequently, within the siding the engine picked up the cars it was after and sought to return to the train, then the signal governing return to the main line could not clear for said engine to rejoin its train because the track is occupied by the remaining portion of the train. As the rule now stands, the only way that the engine can get back to its train is to be granted special permission to violate a stop signal. Under the proposed rule, however, the switch can be thrown, and, the involved signal can give an aspect to the engine allowing it to move back to the train on the main line at not more than restricted speed.

The RLEA is apprehensive that the proposed change in this rule would be a foot-in-the-door approach tending to destroy traffic locking in traffic control territory. They insist that the only way in which opposing signals could be permitted in traffic control territory would be to remove the traffic locking protection. They also point out that under the proposed revision of rule 402 some one other than the control operator would be permitted to authorize opposing movements into a block without the knowledge of the control operator. Concerning the problem of engines returning to trains, the RLEA urges that return to train signals are now in use at many automatic interlocking plants in traffic control territory and that this seems to offer a satisfactory method for handling switching operations, and return-to-train movements. They reiterate their belief that this would be better than to reduce traffic locking in traffic control territory.

They insist that the few instances where it is necessary for an engine to move past a red signal under the present rule, in returning to its train, does not justify such a sweeping change as here is proposed. They urge that the present practice of asking and renewing permission to pass a red signal to return to train does not normally present any undue hazard unless conflicting movements are a factor.

The AAR insists that the proposed revision of this rule will correct a dangerous possibility existing under the present rule.

Discussion and Findings - Rule 136.405. The RLEA is apprehensive about the dissipation of traffic locking through the revision here proposed. However, as seen, the rule is clear in excepting the traffic-locking requirement only in instances when a train is left on the main track while its engine and/or

cars moves or move into an adjacent siding for switching purposes, and must, in returning to its train, reverse its direction for a short distance. In allowing this return-to-train movement to be made with a signal instead of in violation of a signal as at present poses no threat to safety, insofar as this record has shown; in fact, on the contrary, it offers correction of a safety hazard. The Examiner finds that this rule should be revised as last proposed.

Rule 405

Track signaled for movements in both directions, change of direction of traffic. --On track signaled for movements in both directions, occupancy of the track between opposing signals at adjacent controlled points shall prevent changing the direction of traffic from that which obtained at the time the track became occupied, except that when a train having left one controlled point reaches a section of track immediately adjacent to the next controlled point at which switching is to be performed, an aspect permitting movement at not exceeding restricted speed may be displayed into the occupied block.

The purpose of the revision is to provide for the situation where part of a train is left on the main track or in a siding at a controlled point while the engine proceeds to occupy the track between that siding and the adjacent controlled point to perform switching operations. Under the present rule, a signal cannot be displayed for the engine to return to its train because this would require changing direction of traffic with the track occupied. Therefore, instructions must be issued, sometimes verbally, to permit the engine to move back on its train in spite of a red or stop signal indication. The Commission has received several complaints from railroad employee organizations which objected to this method of operation which, as noted, disregards signals. Under the present rule the only way that the engine can get back to its train is to be granted special permission to violate a stop signal. Under the proposed rule the signal can display an aspect permitting the engine to move back to its train at not more than restricted speed.

RLEA is apprehensive that the proposed change in this rule would destroy traffic locking in traffic control territory. RLEA urges that return-to-train signals now in use at many automatic interlockings in traffic control territory offers a satisfactory method for handling switching operations and return to train movements. AAR insists that the proposed revision of this rule will correct a dangerous possibility existing under the present rule.

The change in this rule is designed solely to allow for return-to-train movements. The signals will continue to be under the control of the control operator and so arranged that conflicting aspects to proceed cannot be displayed.

We find that the method of operation contemplated by the proposed rule is preferable to the method of operation followed under the present rule which, as previously indicated, depends on disregarding signals by special instructions sometimes issued verbally. The proposed rule will accordingly be adopted.

CLASSIFICATION OF DEFECTS

405.01 On track signaled for movements in both directions, occupancy of track between opposing signals at adjacent controlled points does not prevent changing the direction of traffic from that which obtained at the time the track became occupied. (Note: Exception added 1/24/66 permits display of an aspect not less restrictive than that indicating "proceed at restricted speed" by a signal to permit a locomotive, with or without cars, to return to a standing portion of the train in the immediate approach to a controlled point during switching operations. Where a carrier provides the necessary arrangement to permit a locomotive to return to its train, as set forth in the exception, such an arrangement when actuated does not constitute a violation of Section 236.405 and should not be reported as such.)

236.407 Approach or time locking; where required.

This rule requires that approach or time locking be provided for each controlled signal where route or direction of traffic can be changed.

Application:

This rule applies to all controlled signals at controlled points where route can be changed or where direction of traffic can be changed. Does not apply to so called "holding signals" between controlled points where the direction of traffic cannot be changed.

RULE 136.407

Under the caption "Centralized Traffic Control Systems" the 1939 rules stated, very simply "411. Approach or time locking shall be provided." In 1950, it was required:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standards

* * *

136.407 Approach or time locking, where required. - Approach or time locking shall be provided for all controlled signals and for all electric locks on hand operated switches.

The following rule is now proposed:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standard

136.407 Approach or time locking. - Approach or time locking shall be provided for all controlled signals.

The only real change in this section is deletion from the present rule of the phrase "and for all electric locks on hand operated switches". The reason is that when section 136.410 was revised the requirement that approach or time locking be provided for electric locks on hand-operated switches was there included, and the thought is that it be retained there instead of here. Accordingly, it is now proposed to be deleted from the present rule. This change is agreed to by all the parties to this proceeding, it is obviously proper, and the Examiner finds its approval.

NPRM
Federal Register
March 21, 1983

Section 236.407 Approach or time locking; where required.

The 1939 rules required approach or time locking shall be provided. The 1950 revisions required approach or time locking on controlled signals and electrically locked hand-operated switches. The 1966 revision deleted from the requirements the reference to electric locks and the existing rule, section 236.407, now reads: "Approach or time locking shall be provided for all controlled signals."

It was suggested that some controlled signals are, in fact, nothing more than "holding signals" used to hold a train at a specific location. Therefore, the parties agree that approach or time locking need only be provided at locations where routes can be changed or direction of traffic can be reversed, and the proposed rule reflects this change.

CLASSIFICATION OF DEFECTS

- 407.01 Approach or time locking not provided for controlled signal where route or direction of traffic can be changed.
- 407.02 Approach locking not effective.
- 407.03 Time locking not effective.
- 236.408 Route locking.

This rule specifies where route locking shall be provided and where it shall become effective in the route entered.

Application:

At any location in traffic control territory where switches are power-operated, route locking must be provided and it must be effective when the first pair of wheels of a locomotive or car passes a point 13 feet in advance of the signal governing its movement. The 13 feet shall be measured from the center of the signal mast to the effective insulated joint. This rule does not apply to controlled signals or automatic signals that do not have power-operated switches in the route governed.

Rule 136.408

The 1939 rules required in traffic control systems:

413. Section on route locking shall be provided where switches are power operated.

In 1950 the following rule was adopted:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standards

136.408 Route locking.--Route locking shall be provided where switches are power operated.

The rule now proposed, changed since the notice, with changes from the present rule underlined, reads as follows:

SUBPART D, TRAFFIC CONTROL SYSTEMS

Standards

136.408 Route locking.--Route locking shall be provided where switches are power-operated. Route locking shall be effective when the first pair of wheels of a locomotive or car passes point not more than 13 feet in advance of the signal governing its movement.

Note . - Relief from the requirements of this section will be granted upon adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

Note 2. -Existing installations on each railroad, which do not conform to the requirements of this section shall be brought into conformity within 5 years of the effective date of this rule.

In traffic-control systems power-operated switches are generally found at controlled points, and controlled points are essentially interlockings. Accordingly, to make this section consistent with Section 136.302 which requires route locking at interlocking, it was agreed at the Pre-hearing conference that revision of this section should be considered to make it consistent with 136.302, as revised and all of the reasons before advanced by the Bureau for modifying section 136.302 apply equally to section 136.408, as proposed. All parties concur in the proposed revision of this rule. Footnote 1 need not be inserted as proposed for the reason stated several times before, that such relief giving provision is being made applicable to all the rules. With this exception the rule will be revised as proposed.

Section 236.408 Route locking.

The requirement that route locking shall be provided for all power-operated switches has remained unchanged since 1939. The last sentence of the existing rule regarding the location where such route locking shall be effective was adopted in 1966 after a particular accident which resulted from the effective insulating joint being too far in advance of the signal. After discussing the matter, the parties have agreed that language should be added to the rule to specify the 13 feet referred to in the last sentence be measured from the signal or the center of the signal mast. It was pointed out by various parties during discussions that a loss of shunt protection similar to the requirements of section 236.309 is desirable in traffic control systems, particularly over power-operated switches in those systems that are controlled by computers or switching systems which automatically operate the power-operated switches. Further, the parties also agree that a loss of shunt requirement should be added to this rule.

The FRA has considered these suggested changes and believe it is in the interest of safety to adopt the proposed changes.

As previously explained in the analysis of sections 236.302 and 236.309, the FRA does not believe adding requirements for loss of shunt protection to this section is appropriate. The FRA has instead proposed that section 236.309 be revised to accomplish this change.

The FRA does propose to revise existing section 236.408 to include a procedure for determining the 13-foot requirements.

CLASSIFICATION OF DEFECTS

- 408.01 Route locking not provided where switches are power-operated.
- 408.02 Route locking not effective.
- 408.03 Route locking not effective until first pair of wheels of locomotive or car passes a point more than 13 feet in advance of the signal governing the movement.
- 236.410 Locking, hand-operated switch.

This rule requires that hand-operated switch in main track be locked either electrically or mechanically in normal position, or a signal be provided to govern train movements to the signaled track. It exempts those hand-operated switches on main track where train speeds do not exceed 20 mph, on signaled sidings without intermediate signals where train speeds do not exceed 30 mph, or where trains are not permitted to clear the signaled track. It requires approach or time locking and provides that locking may be released either automatically or by the control operator after the control circuits of signals governing movements over the switch have been opened directly or by shunting of track circuit.

Application:

Any signaled track in traffic control territory is considered as main track. If speed on main track, except signaled sidings, exceeds 20 miles per hour, each hand-operated switch must comply with this section. Speed may be controlled by permanent speed zone or by signal indication.

Sidings provided with signal protection and without intermediate signals are signaled sidings. If train speed exceeds 30 mph on a signaled siding, each hand-operated switch on such siding must comply with this section.

Hand-operated switches are not required to be locked where trains are not permitted to clear the main track.

Trains may enter such switches provided a car is left on main track, the switch is left open, or derail equipped with switch circuit controller is left in non-derailing position.

Approach or time locking must be provided, for each lock, must be effective, and must be installed in such a manner that it cannot be defeated by any action of train crew members.

Locks may be provided with emergency release device which must be kept sealed. Emergency release device with broken or missing seals, except such release device with latch out feature that opens signal control circuits until reset by signal maintainer, is prohibited.

Lock may be released either automatically or by control operator. Control circuits of signals governing movements over the switch which display aspects more favorable than "Proceed at Restricted Speed" must be opened before locking is released.

Electric or mechanical lock provided with time locking must not release until after expiration of a predetermined time interval sufficient to permit a train, having passed the signal governing movement over the switch displaying aspect to proceed, to pass the switch; or, to permit a train approaching the signal governing movement over the switch displaying aspect to "stop" or "stop, then proceed", to stop.

Electric or mechanical lock provided with approach locking must not release when approach section is occupied until after expiration of a predetermined time interval sufficient to permit a train to stop or to pass the switch. If approach section is unoccupied, lock may release immediately after signal control circuits are opened.

Control circuit for electric lock must be so arranged and installed that shunting of turnout will not release lock for movement to main track.

Locking member of electric or mechanical lock must be so maintained that it cannot be displaced

from its locked position by quickly operating the lock lever or pedestal.

Where signal is provided in lieu of a lock to govern train movements to signaled track, an aspect permitting a train to proceed shall not be displayed until the control circuits for all signals governing movement over the switch on the signaled track are opened, and approach circuits in both directions are unoccupied, or a predetermined time interval has expired.

Where exception (1) is relied upon, it is permissible for trains, after approaching the switch at speeds not exceeding 20 miles per hour, to accelerate after the locomotive occupies the switch points.

The provision of exception (2) does not apply to maintenance-of-way work equipment.

A footnote to this rule requires that all hand-operated switches in traffic control territory be brought into compliance with these provisions on or before December 31, 1986.

INTERSTATE COMMERCE COMMISSION

EX PARTE NO. 171

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 APPLIANCES,
METHODS AND SYSTEMS

IN THE MATTER OF REVISION OF SECTION 136.410

Decided April 3, 1961

Pursuant to the provisions of Section 25(c) of the Interstate Commerce Act, as amended, a new rule is prescribed to supersede Section 136.410 prescribed by the Commission's order of June 29, 1950, as amended.

Edward G. Howard and T. Randolph Buck for railroad witnesses.
Donald W. Bennett and G. P. Sheahan for railroad employe organizations.
Daniel M. O'Donoghue for Interstate Commerce Commission, Bureau of Safety and Service.

FORTY-FOURTH REPORT OF THE COMMISSION

DIVISION 3, COMMISSIONERS TUGGLE, WINCHELL AND McPHERSON

BY DIVISION 3:

The Railway Labor Executives' Association, hereinafter sometimes referred to as the Association, filed exceptions to the report of the Examiner, and the Association of American Railroads and the Bureau of Safety and Service, Interstate Commerce Commission, replied. Exceptions and request for findings not discussed in this report nor reflected in our findings or conclusions have been considered and found not justified.

This investigation was instituted under the authority contained in Section 25(c) of the Interstate Commerce Act, as amended, for the purpose of revising Section 136.410 of the Rules, Standards and Instructions to more adequately meet the present conditions in railroad operations, thereby carrying out more completely the purpose of Section 25. In compliance with the provisions of Section 4(a) of the Administrative Procedure Act, we issued a Notice of Proposed Rule Making, dated June 2, 1960, stating therein that a revision was under consideration of Section 136.410 of the

Rules, Standards and Instructions prescribed by the order of June 29, 1950, as amended. Notice of the proposed rule making was given to the general public by depositing a copy of the notice of June 2, 1960, in the Office of the Secretary of the Commission for public inspection, by filing a copy of the notice with the Director, Office of the Federal Register, and by serving a copy on all interested parties, including common carriers by railroad subject to the Interstate Commerce Act, and National organizations of railroad employees. Such notice was published in Volume 25, Page 5246, of the Federal Register, dated June 11, 1960, and provided that written views, arguments, or suggestions concerning the proposed revision might be filed by interested persons. In response thereto, statements in support of the revision were received from several rail carriers and a statement opposing the revision and including a request for oral argument was filed by the Railway Labor Executives' Association, whose membership consists of 23 standard railway labor organizations. Hearing was held. Briefs were filed by the Association of American Railroads and the Interstate Commerce Commission, Bureau of Safety and Service, in support of the proposed revision and by the Railway Labor Executives' Association in opposition to the revision.

Section 136.410 in its present form reads as follows:

§136.410 Hand-operated switch electrically locked.--Each hand-operated switch hereafter installed in main track where train movements are made at speeds exceeding 20 miles per hour shall be electrically locked in normal position. Electric lock may be unlocked either automatically or by the control operator, but only after control circuits of signals governing movements over the switch in each direction have been opened.

NOTE.--Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

The Notice of Proposed Rule Making, dated June 2, 1960, as published in the Federal Register, contained the proposed revision of Section 136.410, which reads as follows:

§136.410 Locking, hand-operated switch.--Each hand-operated switch in main track shall be locked either electrically or mechanically in normal position, except where

- (1) Train speeds over switch do not exceed 20 miles per hour; or
- (2) Trains are not permitted to clear the main track at such switch; or
- (3) Both switch and traffic-control system were installed prior to October 1, 1950.

Approach or time locking shall be provided and locking may be released either automatically, or by the control operator, but only after the control circuits of signals governing movement in either direction over the switch and which display aspects

with indications more favorable than "proceed at restricted speed" have been opened directly or by shunting of track circuit.

The provisions of Section 136.410 apply only to operations of trains in traffic control system territory where speeds exceed 20 miles per hour, but no changes are proposed in this respect. Under the proposed revision the only essential difference between the proposed and present rule would be the substitution of a mechanical time lock in lieu of an electric lock on a hand-operated switch and the elimination of the requirement that an electric lock be installed at a hand-operated switch in traffic control territory where trains are not permitted to clear the main track. Another difference is the elimination from the present rule of the footnote, which provides for the granting of relief from the requirements of Section 136.410 upon an adequate showing by an individual carrier. Since there was no objection to that portion of the revised rule permitting the use of the mechanical time locks in lieu of electric locks, the only controversial issues remaining for determination in this proceeding relate to a justification for the elimination of the electric lock requirement at hand-operated switches where trains are not permitted to clear the main track and whether a footnote similar to that appended to the present rule should be appended to the proposed rule.

Since the section, or rule, in question applies to operation of trains only in traffic control territory, a brief description of such a signal system will be helpful for a clearer understanding of the issues involved.

A traffic control system is one where signals are provided to govern train movements throughout a designated portion of track in both directions without the necessity for using time table or train order authority for such movements. Track circuits are used extending throughout the limits of the system to detect the presence of trains. There are various types of traffic control systems, and while they may differ in detail, their purpose and general features are the same. A traffic control system is controlled by a dispatcher or control machine operator from a traffic control machine which may be located in the involved territory or may be many miles removed therefrom. Selected passing sidings in the territory are equipped with power-operated controlled switches, and associated signals. Approach signals are provided in approach to main track operator-controlled signals. The control machine is usually equipped with a complete track diagram of the controlled territory and, by means of indication lamps, the operator of the control machine receives indications showing the location of trains in the territory, the existence of a broken rail, an open hand-operated switch, a derail off the rail, or a train or car occupying the block governed by a controlled signal, and the signal aspects permitting entry into the block cannot be displayed by the operator when any of the above conditions exist, even if the operator, through error, attempted to do so. Inasmuch as a passing siding is used for the meeting or passing of trains, the main track must of necessity be cleared. Hence, the relief afforded by Section 136.410, as revised, would not apply. The switches of such a siding would either be provided with power-operated switch machines or would be electrically locked.

Before the dispatcher or operator of a control machine can clear a signal to permit entry of a train into the block in which a non-electrically

locked switch is located, it must be determined that the opposing signal displays a stop aspect and that this stop aspect has been displayed for a predetermined time. The traffic control system is so designed that it is impossible for opposing signals simultaneously to display aspect permitting movement into the block. Upon entry of the train into the block, the signal permitting entry thereto automatically displays a stop aspect as soon as any part of the train passes it and the opposing signal remains in stop position. Both controlled signals governing entry into the block will display stop aspects while the train is serving the spur track. When a train has completed work at the switch on the spur track and has proceeded out of the block, the signals at both ends of the block will remain in stop position until the dispatcher clears a route for another train movement into the block. In traffic control system territory, all controlled signals are normally in red or stop position.

From the foregoing, it is observed that as long as a train occupies the main track within a block in traffic control territory, both signals governing entry into the block will remain at stop. In addition, a traffic control system is so installed and operated that occupancy of the main track by a single car or caboose, under the conditions indicated above, or a switch left open or a derail left off the rail will cause the signals governing entry into the block to display a stop indication, and so long as any one of these conditions exists, these signals will remain at stop. These automatic safety features become effective whether the switch within the block is or is not equipped with an electric lock.

An electric lock is essentially an electromagnetic device, electrically controlled, which can restrict or prevent mechanical manipulation of an interlocking lever, switch stand, switch machine or similar apparatus. As applied to a hand-operated switch an electric lock will prevent opening of the switch unless predetermined conditions exist. The electric lock in locked condition prevents movement of the switch-stand operating lever which is accomplished primarily by means of an electromagnet. If there is no current flowing through the coil of the electromagnet, the magnet will be in a deenergized position and the electric lock will be locked. In order to unlock the electric lock, it is necessary that an electric current be applied to the coils of the electromagnet. Thus, the electric lock is locked when no current is present in the coils so that in the event of a broken wire, battery failure or other similar failure of any of the component parts of the installation, the electric lock will remain locked. A short track circuit is located in the main track immediately ahead of the switch points and when this circuit is so occupied by a train desiring to enter the spur track, the electric lock is automatically conditioned for unlocking. Thereafter, a member of the train crew must remove the switch padlock from the electric lock, after which the electromagnetic coils can be energized and permit unlocking of the electric lock for entry into the spur track.

After a train enters and is in the clear in the spur track and desires to reenter the main track, it is necessary that the dispatcher be contacted and permission obtained for such reentry. After permission has been received from the dispatcher, the derail, if provided, and if operated independently of the switch, must be removed from the rail and the switch padlock removed from the electric lock. Removal of the padlock will permit the electric lock to be unlocked, thereby closing electrical contacts which will activate apparatus located at the opposing controlled signals. This apparatus will

detect whether these signals are in stop position and have been in stop position for the required predetermined time.

A mechanical time lock is a mechanical device which, like an electric lock, can restrict or prevent mechanical manipulation of an interlocking lever, switch stand, switch machine or similar apparatus. As applied to a hand-operated switch, a mechanical time lock will prevent the opening of the switch until predetermined conditions exist. In order to unlock a mechanical time lock, it is necessary that initial action be taken to release the lock. This initial action, when taken, sets the protecting signals approaching the switch in either direction at stop position. A predetermined time interval must elapse before the mechanical time lock unlocks which permits the switch points of the hand-operated switch to be opened. After the switch is unlocked, the train is moved in a manner similar to that described above for movements over a switch which is electrically locked.

A hand-operated switch without an electric or mechanical lock is equipped with a switch circuit controller which opens the signal control circuits or shunts the track circuit if the switch points are open 3/8 of an inch on a trailing point and 1/4 of an inch on a facing switch point. This will cause signals governing entry into the block in which the switch is located to assume the stop position. If an independently operated derail is provided at the clearance point of the industrial spur, it will also be equipped with a circuit controller, and when the derail is raised 1/2 inch from the rail it will, through its circuit controller, shunt the main track of a train or car on the main track, and in this respect, there is no difference between a switch equipped with an electric lock and one not so equipped.

Prior to October 1, 1950, we did not require the installation of electric locks on hand-operated switches in traffic control territory. This requirement was put into effect by the order of June 29, 1950, prescribing Section 136.410, the purpose of which is to prevent an unauthorized entry onto the main track of a train in a siding or spur track. Since the prescription of such requirement, many requests for relief from its provisions have been approved by us on condition that the main track is not cleared. This condition means that an engine with all cars cannot proceed into the spur track beyond the clearance point, which is physically impossible on short spur tracks, replace the derail if one is provided and restore the switch for main track operation. In the event a train does clear the main track by entering the spur track, replacing the derail and closing the switch for main track operation, the indication light on the control operator's panel is automatically extinguished. At this stage no hazard would be created by such clearance, but a hazard would arise if the train, once having cleared the main track, attempted to reenter the main track without proper authority from the dispatcher or operator of the control machine. Since Section 136.410, as revised, will not permit clearance of the main track, the purpose for which this rule was intended will be fulfilled and observance of the requirements of this Section will provide adequate safety for train operation.

The Examiner recommended that the revision as proposed in the Notice of Proposed Rule Making be adopted except that the footnote as set forth in the present Section 136.410 be appended to the revised rule. On exceptions,

the Association objects mainly to the revision insofar as it does not require hand-operated switches to be equipped with electric or mechanical locks where trains are not permitted to clear the main tracks at such switches. This is the main controversial issue in this proceeding. The Association has no objection to the revision of Section 136.410 insofar as it permits the use of a mechanical time lock or an electric lock on main track switches in traffic control territory. The Association particularly excepts to the Examiner's conclusions (1) that safety is neither increased nor diminished by the presence or absence of an electric or mechanical lock at the switch connecting the spur to the main track; (2) that the record does not support the contention that the presence of an electric lock would, in itself, prevent reentry onto the main track from a spur track, thereby creating a hazard; and (3) that the record is convincing that ample protection is afforded by a traffic control system and that hazards could be created only by non-observance or by violation by the train crew of the carrier's operating rules. The Association takes exception to the Examiner's conclusion that adoption of the proposed revision is justified and insists that adoption of such revision will remove protection presently provided for the operation of track motor cars in traffic control territory. In conclusion, it contends that there is no basis for the inclusion of a footnote to the revised rule.

In reply to the exceptions, the Association of American Railroads, hereinafter referred to as the AAR, claims the exceptions of the Railway Labor Executives' Association are without merit and wholly irrelevant to the issues presented by this proceeding and that the Examiner's ultimate conclusion is proper and fully supported by the record. Respecting irrelevancy of the Association's exceptions regarding the value of electric locks in preventing reentry onto the main track in front of an approaching train, the AAR calls attention to the fact that this exception is irrelevant because it again relates only to instances where trains will clear the main track whereas the proposed revision relates to cases where trains will not enter or reenter the main track since trains using the switches in question will not be permitted to clear the main track at those points.

Referring to the Association's exceptions that adoption of the revised rule would remove protection for the operation of track motor cars in traffic control territory, the AAR considers this exception as both irrelevant and mistaken for the reason that the proposed rule is directed exclusively to train movements and has no relation to the movement or operation of track motor cars. Furthermore, since track motor cars do not shunt the track circuits and do not actuate or have any effect on the signal system in traffic control territory, their safety is not dependent on such signals since other means are provided for their operation. Finally, the AAR, in replying to the exceptions concerning the inclusion of a footnote to the proposed rule, points out that such inclusion is not based on speculation as contended by the Association, but on the facts that the rule is a technical one and that many exceptions of various kinds have proved necessary over a period of more than 10 years. This footnote is similar to other footnotes included in many of the Rules, Standards and Instructions prescribed by our order of June 29, 1950, as amended. Inclusion of such a footnote would have no effect on safety since a carrier is not precluded from seeking relief from the rule, whether or not it contains such a footnote and the inclusion of a footnote merely simplifies the procedure in seeking such relief, both from the standpoint of the carrier and this Commission. Applications

for relief from the requirements of those Rules, Standards and Instructions prescribed by the order of June 29, 1950, as amended, having a footnote and which do not involve the taking of testimony at a public hearing or the submission of evidence by opposing parties in the form of affidavits, may be handled by an employee board, recently created, while relief from rules not provided with such a footnote must be obtained by means of a formal petition, referred to a Division of the Commission.

The reply of the Commission's Bureau of Safety and Service to the Association's exceptions follows the pattern of the reply of the AAR and also calls attention to the fact that practically all of the Association's exceptions are predicated on the assumption that trains at all times will clear the main track at a hand-operated switch not electrically or mechanically locked in spite of the fact that such action would be in violation of our order and the operating rules of the carrier. In reply to the Association's claim respecting the safety value of an electric or mechanical lock, insofar as it applies to track motor cars, that it would not be possible for an unauthorized reentry onto the main track by a track motor car if the switch were equipped with an electric or mechanical lock, our Bureau of Safety and Service points out that once the track motor car has entered the main track and the hand-operated switch is restored to normal position and again locked by its electric or mechanical lock, no protection is afforded either to the crew of the track motor car or an approaching train by the traffic control system, since the signal at either end of the block in which the switch is located will display a proceed aspect. An approaching train can then enter the block under authority of the indication of the wayside signal without any knowledge that the block is occupied by a track motor car, thereby resulting in a possible collision and personal injuries. The result could be the same if a track motor car reenters a main track at a switch not equipped with an electric or mechanical lock.

In our opinion, the record in this proceeding is convincing that safety is neither increased nor diminished by the presence or absence of an electric or mechanical lock at a switch connecting a spur to a main track. In the case of a train physically clearing the main track these locks provide a predetermined time interval before the switch to which they are attached can be moved. In the interval the signals governing entry into the block are in their most restrictive aspect and will so remain after the switch is opened and the train enters the main track until the switch is returned to main track operation, the derail, if one is provided, is replaced on the rail and the train clears the block in which the switch is located. In the case of a train which does not clear the main track, the signals governing entry into the block will remain at stop indication so long as the main track is not cleared. Thus the signal system will protect train operations in traffic control territory under the above conditions in the same manner whether the hand-operated switches are or are not equipped with electric or mechanical locks. The mere presence of an electric lock will not prevent reentry onto the main track from the spur track. Once the main track is cleared and the block unoccupied, the electric lock can be unlocked and reentry made onto the main track immediately if no train is approaching the switch within a specified distance, or after the expiration of a predetermined time interval if a train is approaching the switch.

A controversial issue is raised respecting the protection provided by an electrically locked switch against human error either on the part

of the train crew or train dispatcher. In this respect any hazards created through man failure would result from deliberate or negligent violations of operating rules. The safe operation of trains is dependent upon strict observance of and compliance with all operating rules and signals, and neither an electric lock nor any other electrical or mechanical device is capable of preventing hazards or accidents created by deliberate violations of rules or regulations. The Association objects to the revision of Section 136.410 because it anticipates that train crews will violate the requirement that the main track be not cleared, yet it expresses no such anticipation respecting obedience to wayside signals and in this respect takes a different position and assumes that otherwise strict observance will be made of all other operating rules. Respecting anticipated hazards resulting from negligence on the part of the train crew, the Association cites an instance where a train should clear the main track admittedly in violation of the carrier's operating rules and Section 136.410, as revised, and then reenter the main track in front of an approaching train. Before such a hazard could be created, the train crew must commit at least two and in some instances three positive acts. For example, where trains are not permitted to clear the main track, the train must be physically clear of the main track and occupy the spur track beyond the fouling point, the switch must be aligned for main track movement, and where a derail is provided it must be replaced on the rail or if it is of the split point type it must be in derailing position. Furthermore, assuming that the train crew performed these acts, the traffic control system provides a further safeguard in that it does not permit the routing of a movement on the main track until the dispatcher takes affirmative action to clear the signal for such a route. We are convinced on this record that ample protection is afforded train operation by a traffic control system and as outlined above, hazards could be created only by non-observance or violation of the requirement that trains not clear the main track. Our contention in this respect is supported by a witness appearing on behalf of the Association who admitted that so long as the main track is not cleared, which is a requirement of the revised rule, and the switch to the spur track is not equipped with an electric lock, adequate protection will be afforded to train operations.

In our opinion, adoption of the proposed revision of Section 136.410 is justified on this record. Incorporation into this rule of the condition that the main track shall not be cleared at the hand-operated switch of a spur track will eliminate unnecessary expenditure of time and resources incurred not only by this Commission but also by the railroad industry in the processing and hearing of these types of cases. The necessity of equipping certain sidings or spur tracks in traffic control territory with electric or mechanical locks will be eliminated without any sacrifice in safety. The installation costs for an electric lock and a mechanical lock average \$5,000 and \$1,000, respectively. We have concluded in other proceedings that financial considerations cannot be recognized as an excuse for a carrier's failure to provide appliances which afford adequate safety to the traveling public and the railroad employees, and this is one of the reasons advanced by the Association for opposing the proposed revision. In some instances, and as borne out by the record in this proceeding, the cost of installing electric or mechanical locks is so prohibitive as to prevent extension of railroad sidings of spurs to industries located near the rights-of-way; thereby preventing a railroad from completely fulfilling its obligation as a common carrier. Justification for approval or disapproval of the revised rule should not and

cannot be predicated on financial considerations alone, but must be based on the effect such action may have on the safety of train operation. The record in this proceeding is convincing that adoption of the revised rule is warranted not only because safety will not be impaired thereby, but also because more efficient and economical railroad operation will result therefrom. That operation in compliance with the revised rule will be a safe operation is further evidenced by the fact that during the last 10 years no accidents have been reported resulting from the failure to provide an electric lock at any of the locations embraced within the 163 applications wherein relief from the requirements of Section 136.410 has been granted by us subject to the condition that the main track is not cleared.

The final issue for determination in this proceeding concerns the addition to the revised section of a footnote similar to the one now appended to the present rule. The inclusion of such a footnote to the proposed rule will in no way change its effectiveness, nor will it increase or decrease safety to any degree. Its inclusion will merely simplify the procedure in handling requests of individual carriers for relief from the requirements of this rule should a need arise therefore, in that requests could be filed in application form rather than by petition. Due to constant technological improvements in railway signalling such a need not now foreseeable could arise in the future. This footnote differs in no respect from similar footnotes presently appended to many of the rules prescribed by our order of June 29, 1950, in Docket Ex Parte No. 171. Furthermore, the inclusion or omission of this footnote will not deprive any interested party of the right to seek relief from the requirements of this rule. Under the circumstances, the addition of the footnote to the revised rule is justified.

We find that Section 136.410 of the Rules, Standards and Instructions prescribed by the order of June 29, 1950, as amended, should be revised as indicated in the appendix hereto.

An appropriate order will be entered.

APPENDIX

TITLE 49 - TRANSPORTATION
CHAPTER 1 - INTERSTATE COMMERCE COMMISSION
PART 136 - INSTALLATION, INSPECTION, MAINTENANCE, AND REPAIR OF SYSTEMS, DEVICES AND APPLIANCES

EX PARTE NO. 171

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 APPLIANCES, METHODS AND SYSTEMS

REVISION OF SECTION 136.410

ORDER

At a Session of the INTERSTATE COMMERCE COMMISSION, Division 3,
held at its office in Washington, D. C., on the 3rd day of
April, A. D. 1961.

It appearing, That the Commission, having under consideration
revision of Section 136.410 of the Rules, Standards and Instruc-
tions prescribed by the order of June 29, 1950, as amended, issued
a notice of proposed rule making on June 2, 1960, pursuant to Sec-
tion 4(a) of the Administrative Procedure Act (5 U.S.C. 1003), such
notice having been published in the Federal Register on June 11,
1960, (25 F.R. 5246);

It further appearing, That hearing on the matters and things
involved has been held and said Division having, on the date hereof,
made and filed a report containing its findings of fact and conclu-
sions thereon, which said report is hereby referred to and made a
part hereof:

It is ordered, That 49 C.F.R. 136.410, be, and the same is
hereby, revised to read as follows:

136.410 Locking, hand-operated switch.--
Each hand-operated switch in main track shall be
locked either electrically or mechanically in
normal position, except where

- (1) Train speeds over switch do not exceed
20 miles per hour; or
- (2) Trains are not permitted to clear the main
track at such switch; or

- (3) Both switch and traffic-control system were installed prior to October 1, 1950.

Approach or time locking shall be provided and locking may be released either automatically, or by the control operator, but only after the control circuits of signals governing movement in either direction over the switch and which display aspects with indications more favorable than "proceed at restricted speed" have been opened directly or by shunting of track circuit.

NOTE --Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

(Sec. 25(c), 41 Stat. 498, as amended; 49 U.S.C. 26).

Notice of this order shall be given to the general public by depositing a copy thereof in the office of the Secretary of the Interstate Commerce Commission, at Washington, D. C., and by filing it with the Director, Office of the Federal Register.

By the Commission, Division 3.

HAROLD D. McCOY,

Secretary.

(SEAL)

INTERSTATE COMMERCE COMMISSION

EX PARTE NO. 171 (SUB NO. 12)

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 APPLIANCES, METHODS AND SYSTEMS.

IN THE MATTER OF PETITION OF CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY FOR A RULING.

Decided September 22, 1964

Petition seeking a declaratory order, or a further ruling, relative to the removal of locks under Section 136.410 of the Rules, Standards and Instructions, as revised on April 3, 1961, granted, applicable to the entire railroad industry subject to the Act, provided certain procedures and actions are accomplished.

Joseph J. Nagle for petitioner.
Harold C. Heiss and Donald W. Bennett for replicant.

REPORT OF THE COMMISSION

DIVISION 3, COMMISSIONERS TUGGLE, MURPHY AND WALRATH,
By Division 3:

By petition filed June 16, 1964, the Chicago, Milwaukee, St. Paul and Pacific Railroad Company seeks a declaratory order, or an interpretive opinion, to the effect that the order of the Commission entered in Ex Parte No. 171 Rules, Standards, and Instructions for Signal Systems, 313 I.C.C. 441, in regards to the revision of Section 136.410 of the Rules, Standards and Instructions be declared retroactive in its scope. In its reply to the petition, the Brotherhood of Railroad Signalmen argues that the relief here involved should be subject to the usual application procedure as set forth in the Secretary's notice of March 15, 1954.¹

¹ Instructions governing applications under Section 25 of the Interstate Commerce Act.

The question here arises from the following evolvement of rule 136.410. Prior to its revision in the case just cited decided in 1961, the rule read:

136.410 Hand-operated switch electrically locked.-- Each hand-operated switch hereafter installed in main track where train movements are made at speeds exceeding 20 miles per hour shall be electrically locked in normal position. Electric lock may be unlocked either automatically or by the control operator, but only after control circuits of signals governing movements over the switch in each direction have been opened.

Note.--Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute Relief to the same extent from the requirements of this part.

In the revision of 1961 it was changed to the following:

136.410 Locking, hand-operated switch.--Each hand operated switch in main track shall be locked either electrically or mechanically in normal position, except where

- (1) Train speeds over switch do not exceed 20 miles per hour; or
- (2) Trains are not permitted to clear the main track at such switch; or
- (3) Both switch and traffic-control system were installed prior to October 1, 1950.

Approach or time locking shall be provided and locking may be released either automatically, or by the control operator, but only after the control circuits of signals governing movement in either direction over the switch and which display aspects with indications more favorable than "proceed at restricted speed" have been opened directly or by shunting of track circuit.

Note.--Relief from the requirements of this section will be granted upon an adequate showing by an individual carrier. Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of this part.

The important parts of the 1961 revision are the exceptions providing, at least as of the date of that decision and for the future, that electric or mechanical locks need not be installed

(1) where trains speeds do not exceed 20 miles per hour, or (2) where trains are not permitted to clear the main track. Exception (3) has no real bearing here. It was adopted in the revision of the Rules, Standards and Instructions effective October 1, 1950, so as not to place a heavy burden on those railroads having traffic control systems already in service but which did not have electric locks on hand-operated switches.

The installation of such locks in traffic control territory had not been a specific requirement of the Commission prior to that date, and it was deemed an undue burden to require them installed on systems already in service. However, we do not consider exception (3) should be applicable to the past to permit any carrier that had electric locks in service on hand-operated switches prior to October 1, 1950, or that has subsequently installed them, to now remove them because of that fact alone. Once installed the date of installation is immaterial to their removal status.

Shortly after the 1961 decision the question arose as to whether electric locks may be removed where either of exceptions (1) or (2) apply. The Commission's Bureau of Safety and Service informally considered this question and concluded that it still had no order authorizing the blanket and general removal of all electric locks in situations where the excepting circumstances existed. Accordingly it processed Block Signal Application no. 15312, later docketed as No. 28000 (Sub No. 293) for hearing.

In the proceeding just referred to the Chicago, Milwaukee, St. Paul and Pacific Railroad Company sought approval of its proposed modifications of existing traffic control system on single main track near Sabu}a, Iowa, consisting of the removal of electric locks from hand-operated switches at each end of double-end industry track at Elwood, Iowa, and at each end of double-end industry track at Morley, Iowa. The excepting circumstance existing in that proceeding was exception (2) namely, that the main track would not be cleared. In meeting the issue of jurisdiction, or whether further approval was necessary in the premises, the Examiner, in his recommended report, stated:

There is, however, a procedural question, inconsequential to the substance of this case but of some importance as a precedent in future situations of the type here presented. That question, put simply, is whether this application was unnecessary in the first instance, in view of the revised rule, and should be dismissed, or whether it was and is necessary and should be considered in full and an order entered granting the sought relief. On first blush, it would appear that an application in a situation such as here presented is unnecessary as the rule clearly states, in effect, that an electric lock is not required where trains are not permitted to clear the main track. Thus it would seem, on the surface at least, that the filing of an application would be the same as asking the Commission to approve individually what it has already done generally for the

entire industry. That, however, is not the entire picture as the decision of April 3, 1961, in the revision case contains nothing to indicate that it has a retroactive effect covering past installations. In fact, neither in the decision there, nor elsewhere, has authority been expressly given allowing the removal of electric locks once installed. And, once installed, the broad requirement of Section 25 of the Interstate Commerce Act comes into play, that is, that signal systems or parts thereof may not be discontinued or materially modified without the approval of the Commission. Changes such as here involved have been considered material modifications for many years, and generally they have been conceded so by the railroad industry.

Moreover, there is sometimes a question, as presented here but favorably resolved, as to whether the carrier's proposal is endowed with good faith and sufficient implementation to meet the excepting-proviso. It is concluded that an application was necessary in this proceeding and that it should be affirmatively acted upon rather than dismissed.

No exception was filed to the Examiner's report and order and it became effective by operation of law.

The reason exception (2) was inserted in the rule in 1961 is found in the following factual statement at page 444 of the report:

From the foregoing, it is observed that as long as a train occupies the main track within a block in traffic control territory, both signals governing entry into the block will remain at stop. In addition, a traffic control system is so installed and operated that occupancy of the main track by a single car or caboose, under the conditions indicated above, or a switch left open or a derail left off the rail will cause the signals governing entry into the block to display a stop indication, and so long as any one of these conditions exists, these signals will remain at stop. These automatic safety features become effective whether the switch within the block is or is not equipped with an electric lock.

The Commission subsequently stated at page 450 of the same report:

***Justification for approval or disapproval of the revised rule should not and cannot be predicated on financial considerations alone, but must be based on the effect such action

may have on the safety of train operation. The record in this proceeding is convincing that adoption of the revised rule is warranted not only because safety will not be impaired thereby, but also because more efficient and economical railroad operation will result therefrom.***

What we have said is that when the circumstance exists as set forth in either exceptions (1) or (2) a lock is not needed for safety, and, moreover, that efficiency and economy would be enhanced without one. It follows that the benefits of the 1961 revision should be made available not only to the future but to the past.

The only real problem here is the good faith adherence of the industry to one of the two excepting provisos. The Examiner suggested this as an important consideration from a practical standpoint, and we agree. For example, speed limits and orders to clear or not to clear a main track may be changed easily and momentarily. Some degree of permanence and formality must attach to the excepting provisions once the electric locks are removed. In the circumstances, it is found that the order clarifying our decision of 1961 and, in effect, giving a retroactive scope to the revision must be conditioned on the following procedures by each carrier intending to remove a lock under excepting provisions (1) or (2), and upon Commission action as indicated:

1. Each carrier intending to remove a lock under the findings made herein and based on the existence of one or more of the circumstances as set forth in exceptions (1) or (2) as contained in the revised section, shall:
 - (a) notify the Commission by letter setting forth the location of the lock involved and the specific exception on which removal is based.
 - (b) include in the letter to the Commission an assurance that the excepting circumstance relied upon will not be changed without either reinstallation of the electric or mechanical lock, or approval by the Commission of the changed circumstances.
 - (c) Publish in its Time Table, as speed limits are usually published, the not-to-exceed 20 miles per hour speed limit covering the area of the switch, when that is the exception relied upon; or, where exception (2) is relied upon, publish either in the Special Instructions part of its Time Table or in separate printed Special In-

structions the location of each hand-operated switch where electric or mechanical lock is removed and, where train movements are made in excess of twenty (20) miles per hour, concurrently issuing specific instructions, by stating therein, that trains are not to be permitted to clear the main track at such switch.

2. Following the foregoing and upon acknowledgement of the letter to the Commission, such acknowledgement to be made promptly as an administrative action by the Commission's Bureau of Safety and Service, such letter to be retained as authority for the removal and as a record of the exception on which relied, the lock may then be removed.

No other procedure or action appears necessary.

An appropriate order will be entered.

Section 236.410 Locking, hand-operated switch.

The current provisions of section 236.410 identify those hand-operated switches in traffic control systems that are required to be provided with an electric or mechanical lock. Additionally, the manner in which the locks must perform is prescribed and provisions are made for removal of locks under specific conditions.

The 1939 rules did not contain requirements that hand-operated switches in traffic control systems be provided with electric locks. The 1950 revision of the rules recognized the need to electrically lock hand-operated switches in traffic control systems in order to enhance the integrity of operating trains by signal indications. Accordingly, section 136.410 (now section 236.410) was adopted requiring, among other things, that each hand-operated switch installed after October 1, 1950 in traffic control territory be electrically locked where train speeds exceed 20 miles per hour. In 1961 this section was further revised to the extent that mechanical locks may be used in lieu of electric locks and that locks were only required at hand-operated switches where speeds exceeded 20 miles per hour and trains were permitted to clear the main track in systems or at switches installed after October 1, 1950. In 1966 the rule was again revised to permit removal of electric or mechanical locks from hand-operated switches in traffic control territory where trains were not permitted to clear the main track or speeds did not exceed 20 miles per hour, or both, in accordance with procedures appended to the rule in a footnote.

The activity surrounding section 236.410 indicates that the requirements contained in this section have continually been made more reflective of railroad operating problems. Still there is substantial need for additional change. During the informal meetings extensive discourse occurred between the parties concerning the need for further revision. These discussions failed to result in a unanimous consensus. However, as a result of the information provided by the interested parties, the FRA believes section 236.410 can be modified to provide more flexible requirements for railroad operating conditions without sacrificing the level of safety existing under the current requirements.

The FRA proposes to amend paragraph (a) of section 236.410 to require each hand-operated switch in signaled track in traffic control territory be provided with either an electric or mechanical lock unless: (1) train speeds over the switch do not exceed 20 miles per hour; (2) trains are not permitted to clear the signaled track at such switch; (3) both switch and traffic-control system were installed prior to October 1, 1950; or (4) a signal is provided to govern train movement from the auxiliary track to the signaled track.

The FRA proposal that a new exception be added to paragraph (a) will permit the use of a signal in lieu of an electric or mechanical lock. The signal will clearly provide the same continuity of operation by signal indication as an electric or mechanical lock.

The FRA also proposes to modify section 236.410 by the addition of paragraph (c). This modification will prescribe the performance of a signal installed to govern train movements from the auxiliary track to the main track in lieu of an electric or mechanical lock on a hand-operated switch.

The final change proposed by the FRA will delete the footnote to section 236.410. The FRA has proposed placing provisions for removal of electric or mechanical locks in Part 235, section 235.8. The FRA has determined the industry is capable of achieving compliance of train operations prescribed by the footnote in procedures more suitable to individual properties. Therefore, the real change here reduces the paper burden and does not affect safety of train operation.

The parties concur with these proposals.

Section 236.410 - Locking, hand-operated switch; requirements.

FRA proposed to amend this section by permitting the use of a signal in lieu of a mechanical or electric lock, at the option of the railroad, and by deleting the footnote which provided for removal of such locks under certain conditions. The provisions of the footnote would be revised and placed in section 235.7 of this title.

One commenter noted that FRA's interpretation, that all signaled track constitutes main track for the purpose of these requirements, will necessitate the installation of electric or mechanical locks on signaled sidings which individual railroads had previously considered exempt from such a requirement because the carrier considered them to be auxiliary tracks. The commenter did not take issue with FRA's interpretation, but requested that FRA "grandfather" those existing hand-operated switches in order to avoid the cost burden of a retrofit program. The commenter stated that the railroads could identify the locations of the nonequipped switches to assist FRA in monitoring them. Another commenter supported this position and noted FRA had acted in a similar fashion by exempting nonequipped switches installed prior to 1950.

Another commenter opposed the concept of "grandfathering" any switches and recommended that any previous exemptions have finite time frames. That commenter also suggested that the provisions of this section be extended and made applicable to ABS systems.

In adopting the final rule FRA has decided to change this section to respond to the points raised by the commenters. The commenter is correct that FRA considers all signaled track to be main track for the purposes of this section. Since the method of operation in TCS territory is by signal indication, electric or mechanical locks serve to maintain the integrity of that method of operation by prohibiting unauthorized occupancy of signaled or main track. In most instances, the ability to operate a lock constitutes authority for a train to proceed from auxiliary to main track. Therefore, the lock serves a purpose similar to a signal in that it prevents operation of the switch until it is safe to do so.

The safety goals which can be achieved through the use of such a locking device can also be achieved through other means. Two of these, slow speed and prohibiting the clearing of main track, have been contained in this section for many years. FRA proposed to add a third, the use of a signal to govern the movement, when it issued this NPRM. On further review, FRA has determined that a slightly revised approach to the slow speed concept will provide a fourth way to achieve the desired level of safety. By adding this new provision, FRA will permit use of nonequipped switches on signaled sidings that do not have intermediate signals if train speeds do not exceed 30 miles per hour. Trains entering such sidings are generally decelerating, are easier to control from a train handling perspective, and are prepared to stop on the siding for meeting or passing another train.

Because they will have occupied the switch points of the nonequipped switches, trains leaving such sidings will be permitted to accelerate up to 30 miles per hour. Thus, this increased speed over hand-operated switches of such sidings is not a significant decrease in safety. Sidings having intermediate signals or intermediate controlled points will continue to be considered main tracks that require hand-operated switches to be locked either electrically or mechanically where trains are permitted to clear the signaled track and train speeds exceed 20 miles per hour.

In view of this safety rationale FRA has decided that long-term retention of the "grandfather" concept for pre-1950 installations or extension of that concept as suggested by some commenters is not warranted. Consequently, FRA has added a footnote to this section that requires existing switches to be brought into compliance over a three-year period. FRA estimates there are approximately 100 switches that were previously "grandfathered" on the basis of pre-1950 installation and roughly 200 switches that were installed on tracks that carriers had denominated auxiliary track. A three-year period either to equip these switches with locks or to modify train operations so as to place them in an exempt category should be sufficient in FRA's judgement.

Although adopting the suggestion to eliminate the "grandfather" concept, FRA has rejected that commenter's other suggestion to extend the requirements of this section to ABS systems. In contrast to the method of operation in TCS territory, the method of operation in ABS territory is by timetable and train orders in conjunction with the signal system. A train is not permitted to proceed, except by train order, regardless of the indication of a signal governing its movement. Experience has shown that the redundancy of timetable, train orders, and block signals is sufficient to ensure the safety of train operation in ABS systems, and the proposal to make this section applicable to ABS systems would impose an immense economic burden on the industry without a significant improvement in safety.

CLASSIFICATION OF DEFECTS

- 410.01 Hand-operated switch on main track not electrically or mechanically locked in normal position where signal is not provided to govern movement to main track and train movements are made at speeds in excess of 20 miles per hour and train or engine movements may clear the main track.
- 410.02 Hand-operated switch on signaled siding not electrically or mechanically locked in normal position where signal is not provided to govern movements to signaled siding and train movements are made at speeds in excess of 30 miles per hour and train or engine movements may clear the signaled siding.
- 410.03 Approach or time locking not provided for electric lock on hand-operated switch.
- 410.04 Time locking not provided in connection with mechanical lock on hand-operated switch.
- 410.05 Approach or time locking not provided for signal used in lieu of electric or mechanical lock.
- 410.06 Electric or mechanical lock on hand-operated switch can be unlocked before control circuits of signals governing movements over the switch, which display aspects more favorable than "proceed at restricted speed", have been opened directly or track circuit has been shunted.
- 410.07 Signal provided in lieu of electric or mechanical lock can display an aspect to proceed before control circuits of signals governing movements over the switch have been opened.
- 410.08 Electric or mechanical lock on hand-operated switch can be unlocked before expiration of predetermined time interval where time locking is provided.
- 410.09 Signal provided in lieu of electric or mechanical lock can display an aspect to proceed before expiration of predetermined time interval where time locking is provided.

- 410.10 Electric lock on hand-operated switch can be unlocked before expiration of predetermined time interval, with approach section occupied, where approach locking is provided.
- 410.11 Signal provided in lieu of electric or mechanical lock can display an aspect to proceed before expiration of predetermined time interval, with approach section occupied, where approach locking is provided.
- 410.12 Approach or time locking of electric lock at hand-operated switch can be defeated by the unauthorized use of emergency release device of electric lock which is not kept sealed in the non-release position.

236.426 Interlocking rules and instructions applicable to traffic control systems.

This rule prescribes the following interlocking rules and instructions be applied to traffic control systems.

- 236.327 Switch, movable-point frog split-point derail.
- 236.328 Plunger of facing point lock.
- 236.330 Locking dog of switch-and-lock movement.
- 236.334 Point detector.
- 236.342 Switch circuit controller.

Application:

Above rules and instructions apply to traffic control systems.

236.476 Interlocking inspections and tests applicable to traffic control systems.

This rule prescribes the following interlocking inspections and tests be made of traffic control systems.

- 236.377 Approach locking.
- 236.378 Time locking.

236.379 Route locking.

236.380 Indication locking.

236.382 Switch obstruction test.

236.383 Valve locks, valves and valve magnets.

236.386 Restoring feature on power switches.

Application:

Above inspections and tests apply to traffic control systems. Results of tests shall be recorded in compliance with Rule 236.110.

NPRM
Federal Register
March 21, 1983

Section 236.476 Interlocking inspections and tests applicable to traffic control systems.

This section provides that certain inspections and tests pertaining to interlockings also apply to traffic control systems. The FRA has proposed to move the requirements of section 236.385 to Subpart A, which is applicable to all systems. Therefore, the FRA proposes to delete from section 236.476 the reference to section 236.385.

SUBPART E - AUTOMATIC TRAIN STOP, TRAIN CONTROL AND CAB
SIGNAL SYSTEMS

STANDARDS

236.501 Forestalling device and speed control.

This rule permits the use of a forestalling device in automatic train stop systems and sets forth the minimum requirements for control of speed in automatic train control systems.

Application:

Applies to automatic train stop and train control systems.

An automatic train stop system may, but is not required to, include an acknowledging device by means of which the automatic application of the brakes can be forestalled.

An automatic train control system is required to have one or more of the following features:

- (1) A low-speed restriction, effective as long as the condition that causes the restriction exists, that prohibits movement exceeding slow speed either after the train has been stopped by automatic application of the brakes or its speed reduced to slow speed by manual application of the brakes.
- (2) A medium-speed restriction that, in order to prevent an automatic application of the brakes, requires the train to proceed under medium speed after passing a signal displaying an approach aspect, or when approaching a signal requiring a stop, or a stop indication point.
- (3) A maximum-speed restriction that will effect an automatic brake application

whenever the predetermined maximum authorized speed is exceeded.

The speeds imposed by the slow speed or medium speed restrictions must comply with the carrier's definition of slow speed or medium speed which may not exceed that defined by Rules 236.813 or 236.811, respectively, without approval of FRA. Each carrier establishes its own maximum speed.

CLASSIFICATION OF DEFECTS

- 501.01 Automatic train control system with low-speed restriction does not enforce slow speed after train has been stopped by an automatic application of the brakes, until the apparatus is automatically restored to normal because the condition which caused the restriction no longer affects the movement of the train.
- 501.02 Automatic train control system with low-speed restriction does not enforce slow speed after the speed of the train, under control of the engineman, has been reduced to slow speed, until the apparatus is automatically restored to normal because the condition which caused the restriction no longer affects the movement of the train.
- 501.03 Automatic train control system with medium-speed restriction does not require train to proceed under medium speed after passing a signal displaying an approach aspect in order to prevent an automatic application of the brakes.
- 501.04 Automatic train control system with medium-speed restriction does not require train to proceed under medium speed when approaching a signal requiring a stop, or a stop indication point in order to prevent an automatic application of the brakes.
- 501.05 Automatic train control system with maximum-speed restriction does not require train to proceed at or under maximum authorized speed in order to prevent an automatic application of the brakes.

236.502 Automatic brake application, initiation by restrictive block conditions stopping distance in advance.

This is a companion rule to Rule 236.504 and requires that the automatic brake application be initiated at least stopping distance from the entrance of a block where any condition exists as described in Rule 236.205.

Application:

Applies to automatic train stop and train control systems.

This rule requires that an automatic train stop or train control system be so arranged that it will operate to initiate an automatic brake application at least stopping distance in approach to a block wherein any condition described in Rule 236.205 exists and at each main track signal requiring a reduction in speed.

This rule is applicable to signals governing movements on or onto the main track. Signals on auxiliary tracks, whether signaled or non-signaled, are exempt from the requirements of this rule.

RULE 136.502

The 1939 rules required:

AUTOMATIC TRAINSTOP AND TRAIN CONTROL SYSTEMS

Standards

* * *

504. An automatic trainstop, train control, or speed control device shall be operative at braking distance from the stop-signal location if signals are not overlapped, or at the stop signal location if an adequate overlap is provided.

The present rule reads:

SUBPART E, AUTOMATIC TRAINSTOP, TRAIN CONTROL AND CAB-SIGNAL SYSTEMS

Standards

* * *

136.502 Automatic brake application, initiation by restrictive block conditions stopping distance in advance.-- An automatic trainstop or train control system shall operate to initiate an automatic brake application at least stopping distance from the entrance to a block, wherein any condition described in 136.205 obtains, and at each signal requiring a reduction in speed.

As now proposed with changes underlined it reads, under the same subpart and caption:

136.502 Automatic brake application, initiation by restrictive block conditions stopping distance in advance.-- An automatic trainstop or train control system shall operate to initiate an automatic brake application at least stopping distance from the entrance to a block, wherein any condition described in 136.205 obtains, and at each main track signal requiring a reduction in speed.

The only change in this section is the insertion of the words "main track" before the word "signal" in the last phrase of the rule. The present rule has never been construed by the Bureau as requiring the initiation of an automatic brake application at signals governing movements on other than main track such as slidings or yard tracks. This proposed rule would simply clarify its intent.

An additional point, it has been suggested that the term "main track" be defined, and one of the proposed definitions is the same as the definition in the Standard Code of Operating Rules of the Association of American Railroads. That definition reads as follows:

"Main Track - A track extending through yards and between stations, upon which trains are operated by timetable or train order, or both, or the use of which is governed by block signals.

However, this AAR definition conflicts with the intended purpose of revising the rule, since under this definition a siding, which is signaled, is a main track and the intent of the revision, as above stated, is to exclude such tracks as sidings and yard tracks. In order to overcome this conflict it is now proposed to define "main track" and "siding" as follows:

Main Track - A track other than an auxiliary track, extending through yards and between stations, upon which trains are operated by timetable or train orders or both, or the use of which is governed by block signals.

Siding - An auxiliary track for meeting or passing trains.

The adoption of these just given definitions will carry out the intent of the proposed revision of the rule, which is to exclude auxiliary tracks as sidings and yard tracks from the requirements of the rule.

The above definitions are to be controlling definitions of what is a main track and what is a siding for the purposes of this rule. A carrier's designation of a track to the contrary is to have no application here.

The RLEA gave no evidence in opposition to this revised rule, though it still opposes it.

The Examiner finds that the rule should be revised as now proposed and that the last proposed definition of main track and siding also be officially adopted.

CLASSIFICATION OF DEFECTS

- 502.01 Automatic train stop or train control system does not operate to initiate an automatic brake application at least stopping distance from the entrance to a block occupied by a train, locomotive, or car.
- 502.02 Automatic train stop or train control system does not operate to initiate an automatic brake application at least stopping distance from the entrance to a block in which the points of a switch are not closed in proper position.
- 502.03 Automatic train stop or train control system does not operate to initiate an automatic brake application at least stopping distance from the entrance to a block in which an independently operated fouling-point derail equipped with switch circuit controller is not in derailing position.
- 502.04 Automatic train stop or train control system does not operate to initiate automatic brake application at least stopping distance from the entrance to a block in which a track relay is in deenergized position or device which functions as a track relay is in its most restrictive state.
- 502.05 Automatic train stop or train control system does not operate to initiate an automatic brake application at signal requiring a reduction in speed.
- 236.503 Automatic brake application; initiation when predetermined rate of speed exceeded.

This is a companion rule to Rule 236.501 and requires overspeed protection of all restrictive features used in automatic train control systems.

Application:

Applies to automatic train control systems only. This rule requires that automatic train control apparatus function to initiate an automatic brake application whenever the speed of the train exceeds

any predetermined setting of the speed control mechanism. A tolerance of three miles per hour is permitted in excess of the predetermined setting of the speed control mechanism.

CLASSIFICATION OF DEFECTS

503.01 Automatic train control system does not operate to initiate an automatic brake application when the speed of the train exceeds the predetermined rate as required by the setting of the speed control mechanism.

236.504 Operation interconnected with automatic block-signal system.

This rule prescribes the use and operation of an automatic trainstop or train control system.

Application:

Applies to automatic train stop and train control systems.

This rule requires that an automatic train stop or train control system operate in connection with an automatic block signal system. The train stop or train control system must be so interconnected with the signal system that it will impose an automatic application of the brakes in event the engineman fails to acknowledge or obey a main track signal requiring a reduction in speed.

This rule is applicable only to those signals governing movements on or onto the main track. Signals on auxiliary tracks are exempt from the requirements of this rule.

RULE 136.504

The 1939 rules required:

AUTOMATIC TRAINSTOP AND TRAIN CONTROL SYSTEMS

Standards

* * *

506. The apparatus shall be so constructed as to operate in connection with a system of fixed block or interlocking signals, if conditions so require, and so interconnected with the fixed signal system as to perform its intended function (a) in event of failure of the engineman to obey the signal indications; and (b) so far as possible, when the signal fails to indicate a condition requiring an application of the brakes.

In 1950 the rule was changed to the following:

SUBPART E, AUTOMATIC TRAINSTOP, TRAIN CONTROL AND CAB SIGNAL SYSTEMS

Standards

* * *

136.504 Operation interconnected with automatic block signal system.-- An automatic trainstop or train control system shall operate in connection with an automatic block signal system and shall be so interconnected with the signal system as to perform its intended function in event of failure of the engineman to obey a signal requiring a reduction in speed.

The instant proposal is as follows, under the same subpart and caption with changes underlined:

136.504 Operation interconnected with automatic block signal system.-- An automatic trainstop or train control system shall operate in connection with an automatic block signal system and shall be so interconnected with the signal system as to perform its intended function in event of failure of the engineman to obey a main track signal requiring a reduction in speed.

In section 136.502, the only change in this rule is the insertion of the words "main track" before the word "signal" in the last part of the rule, and for the same reason. Also it is believed that insertion of the definitions for main track and siding, as given before, will help to clarify this rule.

The RLEA does not support the proposed revision of this rule, but neither did it adduce any evidence against it. The Examiner finds that this proposed revision should be approved.

Section 236.504 Operation interconnected with automatic
block-signal system.

The 1939 rules required the ATS or ATC systems operate in connection with fixed signals of a wayside system and be so interconnected with the wayside system that the ATS or the ATC would perform its function if the engineer fails to obey a signal indication.

As adopted in 1950, the present rule provides that the ATS or ATC system shall be interconnected with the signal system which may or may not have wayside signals. Further, the rule requires the system to perform its intended function if the engineer fails to obey a signal requiring a reduction in speed. In 1966 the wording of the rule was changed by adding the words "main tracks" so that the rule only applied to signals governing movements on the main track. This revision relieved the carriers of the requirement for an inductor, circuit or device to be associated with a signal on a siding.

In informal meetings it was stated that an intermittent ATS system cannot comply with that portion of the present rule which requires the system to perform its intended function if the engineer fails to obey a main track signal. The engineer can simply acknowledge the restrictive signal and continue the train movement at maximum authorized speed.

One party proposed new language for this rule that clarifies the rule, makes the rule more meaningful and at the same time retains the true purpose and intent of the rule. The other parties have reviewed this proposal and agreed to the suggested changes.

The FRA has reviewed these suggestions and proposes to revise this section accordingly.

Section 236.504 - Operation interconnected with automatic block-signal system.

FRA proposed to clarify the provision of this section by stating in more technical terminology how continuous and intermittent inductive ATC and ATS systems must react to wayside systems.

One commenter recommended that FRA consider "elimination" of the intermittent inductive ATS system since a restrictive wayside signal can be acknowledged but does not enforce a reduction in speed to that prescribed by the restrictive wayside signal.

The commenter is correct in its analysis of the ATS system. However, the system does serve a safety function by ascertaining if the engineer is alert. Failure of the engineer to react properly will cause the ATS system to stop the train. Two major carriers still have a total of 2440 miles of intermittent inductive ATS systems in service over which passenger trains operate at speeds up to 90 miles per hour. The elimination of this type of ATS would constitute a significant reduction in safety. Consequently, the rule has been adopted as proposed.

CLASSIFICATION OF DEFECTS

504.01 Automatic train stop or train control system does not operate in connection with an automatic block signal system.

504.02 Automatic train stop or train control system not so interconnected with the signal system as to perform its intended function in the event of failure of the engineman to acknowledge or obey signal requiring a reduction in speed.

236.505 Proper operative relation between parts along roadway and parts on locomotive.

This rule requires that proper operation occur between parts along the roadway and parts on the locomotive under all conditions.

Application:

Applies to automatic cab signal, train stop and train control systems.

This rule requires that apparatus on locomotives and at wayside locations be properly interconnected and function as intended regardless of speed, weather, wear, oscillation or shock.

CLASSIFICATION OF DEFECTS

505.01 Proper operative relation between the parts along the roadway and the parts on the locomotive does not obtain under all conditions of speed, weather, wear, oscillation, and shock.

236.506 Release of brakes after automatic application.

This rule prescribes the conditions under which the brakes may be released following an automatic brake application.

Application.

Applies to automatic train stop and train control systems.

An intermittent inductive automatic train stop system shall not permit release of the brakes following an automatic brake application until after the train has been stopped.

A continuous inductive automatic train stop system shall not permit release of the brakes following an automatic brake application until after the train has been stopped, unless the condition that caused the brake application no longer exists.

An automatic train control system shall not permit release of the brakes following an automatic brake application until the speed has been reduced to a predetermined rate or until the train has been stopped unless the condition that caused the brake application no longer exists.

This rule prohibits use of a reset device in the control compartment that, when operated, permits release of the brakes before the train has been stopped.

CLASSIFICATION OF DEFECTS

- 506.01 Automatic train stop apparatus permits release of the brakes after automatic application before a reset device has been operated, while the condition that caused the brake application still affects the movement of the train.
- 506.02 Automatic train control apparatus permits release of the brakes after automatic application before the speed of the train has been reduced to a predetermined rate, while the condition that caused the brake application still affects the movement of the train.
- 506.03 Reset device so located that it can be operated by engineer without leaving his/her accustomed position in the cab and not so arranged as to prevent release of the brakes until the train has been stopped.
- 506.04 Brakes can be released following automatic brake application after reset device has been operated before train has been stopped, while the condition that caused the brake application still affects the movement of the train.

236.507 Brake application; full service.

This is a companion rule to Rule 236.502 and requires the apparatus on the locomotive, when operated, to impose a full service application of the brakes.

Application:

Applies to automatic train stop and train control systems.

This rule requires that an automatic train stop or train control brake application be a full service brake application as defined by Rule 236.701. The imposition of an emergency brake application is prohibited.

CLASSIFICATION OF DEFECTS

507.01 Automatic train stop or train control apparatus, when operated, does not cause a full service application of the brakes.

236.508 Interference with application of brakes by means of brake valve.

This rule prohibits use of apparatus that affects the proper functioning of the brake system.

Application:

Applies to automatic cab signal, train stop and train control systems.

When devices covered by this subpart are cut in service, the air passage of the automatic brake valve is necessarily altered, especially in train stop and train control systems.

This rule prohibits the installation and use of apparatus that interferes with the manual application of the brakes by means of the independent or automatic brake valves or that impairs the efficiency of the air brake or blended brake system when operated manually.

Section 236.508 Interference with application of brakes
by means of brake valve.

The requirements of the existing rule were contained in the 1939 rules as section 136.7(12). Those requirements were continued unchanged in the 1950 revisions when only editorial changes were made.

One party now submits that the language of the existing rule seems to preclude the use of electrical braking systems or of blended braking systems. It has suggested the word "air" be deleted from the rule so that the rule will apply to all types of braking systems which are presently used or which might be developed in the future. The other parties agree. Therefore, the FRA proposes to revise this section to permit the use of a blended braking or other system equally or more efficient than the present air brake system.

CLASSIFICATION OF DEFECTS

508.01 Automatic train stop, train control, or cab signal apparatus interferes with the application of the brakes by means of the brake valves.

508.02 Automatic train stop, train control, or cab signal apparatus impairs the efficiency of the brake system.

236.509 Two or more locomotives coupled.

This rule requires automatic train stop, train control, or cab signal apparatus be operative only on the locomotive from which the brakes are controlled.

Application:

Applies to automatic cab signal, train stop and train control systems.

When two or more equipped locomotives are coupled together, or a pushing or helping locomotive is used, the automatic train stop, train control or cab signal apparatus affecting movement of that train must be so arranged that it is operative only on the locomotive from which the brakes are controlled.

CLASSIFICATION OF DEFECTS

509.01 Automatic train stop, train control, or cab signal apparatus not arranged so that when two or more locomotives are coupled, or a pushing or helping locomotive is used, it can be made operative only on the locomotive from which the brakes are controlled.

236.511 Cab signals controlled in accordance with block conditions stopping distance in advance.

This rule requires that automatic cab signals be continuously controlled and provide proper aspects and stopping distances to conditions described in Rule 236.205.

Application.

Cab signals are required to be continuously controlled to indicate that speed is to be restricted and stop may be required at least stopping distance to all conditions described in Rule 236.205.

Conditions that cause wayside false restrictive aspects such as open or crossed light circuit conductors or burned out lamp bulbs, except where light-out protection is provided, are exempt from these requirements.

CLASSIFICATION OF DEFECTS

511.01 Automatic cab signal system not so arranged that cab signals are continuously controlled in accordance with conditions that obtain at least stopping distance in advance. (Applies only to conditions described in parts (a), (b), (c), and (d) of Section 236.205 of the Rules, Standards, and Instructions.)

236.512 Cab signal indication when locomotive enters block where restrictive conditions obtain.

This is a companion rule to Rule 236.514 and requires the cab signal indicate "Proceed at Restricted Speed" when a locomotive enters or is within a block in cab signal territory wherein a condition described in Rule 236.205 exists except where a signal control circuit is deenergized.

Application:

This rule requires that the cab signal indicate "Proceed at Restricted Speed" when the locomotive enters or is within a block occupied by a train, locomotive or car; in which the points of a switch are not closed in proper position; in which an independently operated fouling point derail equipped with switch circuit controller is not in derailing position; or, where there are two or more track circuits, a track relay is in deenergized position.

Rule 236.514 permits the cab signal to change to a more favorable aspect after the train has passed the condition that exists or if the condition ceases to exist.

CLASSIFICATION OF DEFECTS

- 512.01 Automatic cab signal does not indicate "Proceed at Restricted Speed" when locomotive enters or is within a block occupied by a train, locomotive, or car.
- 512.02 Automatic cab signal does not indicate "Proceed at Restricted Speed" when locomotive enters or is within a block in which the points of a switch are not closed in proper position.
- 512.03 Automatic cab signal does not indicate "Proceed at Restricted Speed" when locomotive enters or is within a block in which an independently operated fouling-point derail equipped with switch circuit controller is not in derailing position.
- 512.04 Automatic cab signal does not indicate "Proceed at Restricted Speed" when locomotive enters a block in which a track relay is in deenergized position or device that functions as a track relay is in its most restrictive state. (Where there is more than one track circuit in the block.)

236.513 Audible indicator.

This rule requires that when the cab signal aspect changes to a more restrictive indication, an audible indicator shall sound continuously until silenced by manual operation of an acknowledging device. It requires that the cab indicator have a distinctive sound that can be clearly audible throughout the cab under all conditions.

Application:

Applies to automatic cab signal, train stop, and train control systems.

This rule requires an audible indicator be provided in cab signal systems and so arranged that it will sound continuously until silenced by manual operation of an acknowledging device when the cab signal changes to display a more restrictive aspect. The audible indicator may be electrically or pneumatically operated and must have a distinctive sound that identifies it with the system and be clearly audible throughout the cab under all operating conditions. The audible indicator may be so arranged that it will sound continuously during an overspeed condition and silenced only by reducing to proper speed.

Methods to silence or quieten the cab indicator such as wrapping or plugging with paper or cloth or bending or breaking the air pipe to reduce air flow are prohibited.

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Section 236.513 Audible Indicator.

Sections 236.513 and 236.516 are companion rules applying to the audible indicator of ATS, ATC and ACS.

The parties have agreed that the two sections should be consolidated for purposes of simplicity and clarity.

The FRA also agrees and proposes to consolidate these rules.

CLASSIFICATION OF DEFECTS

- 513.01 Audible cab indicator of automatic cab signal system does not sound continuously until silenced by manual operation of acknowledging device, when cab signal changes to a more restrictive aspect.
- 513.02 Cab indicator does not have a distinctive sound.
- 513.03 Cab indicator not clearly audible throughout cab under all operating conditions.
- 236.514 Interconnection of cab signal system with roadway signal system.

This rule prohibits the cab signal from indicating a speed higher than that authorized by roadway signal indication except when the condition changes after the roadway signal has been passed.

Application:

Applies to automatic cab signal systems.

This rule requires the locomotive cab signal apparatus be so interconnected to the wayside signal system that it will not authorize operation at a speed higher than that authorized by the wayside signal indication except when conditions affecting the movement of trains in a block change after the train passes the wayside signal.

These requirements apply to all signaled track, including signaled sidings and signaled auxiliary tracks, in automatic cab signal territory.

CLASSIFICATION OF DEFECTS

- 514.01 Cab signal indication authorizes operation of train at a speed higher than that authorized by indication of roadway signal that governed movement of train into block. (Does not apply when conditions affecting movement of train in the block change after train passes signal.)
- 236.515 Visibility of cab signals.

This rule requires that the cab signal be so

located that the locomotive crew member or members can plainly see the aspect.

Application:

Applies to automatic train stop, train control and cab signal systems.

Cab signals are required to be so installed that the crew member or members can plainly see the aspect displayed from their accustomed positions in the cab. The cab signal is required to be properly illuminated, without cracked or broken roundels and its view not obstructed by other equipment installed in the cab.

Section 236.515 Visibility of cab signals.

The present rule reads as follows: "The cab signals shall be plainly visible to members of the locomotive crew from their stations in the cab."

It is true that occasionally there is only one crew member in the locomotive, particularly on commuter cars. The AAR feels the wording of the present rule implies that a locomotive crew shall consist of more than one person.

Thus, one party proposed, and the other parties agreed, to add the words "member or" to the rule to clearly denote that there may be only one locomotive crew member. The FRA concurs and proposes to so revise this section.

CLASSIFICATION OF DEFECTS

515.01 Cab signal not plainly visible to member of locomotive crew from his/her station in the cab.

236.516 Power supply.

This rule requires that each automatic train stop, train control or cab signal device hereafter installed on a locomotive operate from a separate or isolated power supply.

Application:

Applies to automatic train stop, train control, and cab signal systems.

The rule requires that the device be provided with a power supply used solely to operate the device. It is prohibited to utilize the power supply for any other purpose.

Devices installed on locomotive prior to the effective date of these RS&I are exempt from this requirement.

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Section 236.516 Cab indicator; requirement.

As previously stated in this NPRM the provisions contained in this rule would be consolidated into section 236.513. Therefore, this section would be deleted.

Section 236.516 Power supply.

During the discussions of other rules regarding cab signals, specifically section 236.551, "Power supply voltage; requirements," the parties realized that a serious problem had developed with regard to automatic cab signal, train stop and train control power supplies on certain locomotives.

The original 1939 rules addressed the problems of a generator type of power supply which furnished power to only the headlight and the on-board cab signal, train stop, or train control equipment. However, during the past decade solid state power supplies have been developed that can supply control devices.

The problem has developed because a particular type of ATC has been manufactured that uses a power supply common to all other electrical control circuits on the locomotive. This type of power supply is almost impossible to keep clear of grounds. For example, the circuit can be grounded by carbon dust on the frames of blower motors.

During the discussions of these problems, the involved parties suggested that power supplies for ACS, ATS and ATC systems should be a separate and distinct power supply to eliminate interference from other electrical control circuits. The FRA has considered the matter and proposes the adoption of a new rule to correct this problem. However, if the existing installations were required to be brought into compliance, a severe economic burden would be placed on certain carriers. Therefore, the FRA proposes to make this section applicable only to systems hereafter installed. This proposal recaptions section 236.516 and contains these changes.

CLASSIFICATION OF DEFECTS

- 516.01 Automatic train stop, train control, or cab signal device not provided with an isolated or separate power supply. (Does not apply to devices installed prior to February 27, 1984.)
- 516.02 Power supply used to operate equipment other than automatic train stop, train control, or cab signal device.

RULES AND INSTRUCTIONS: ROADWAY

- 236.526 Roadway element not functioning properly.

This rule requires that when the roadway element, except track circuit, of an automatic train stop, train control, or cab signal system has failed to perform its intended function, the associated signal shall be caused manually to display the most restrictive aspect.

Application:

Applies to automatic train stop, train control, and cab signal systems.

This rule requires that when a roadway element such as a tripper, inductor, loop, or electric circuit, except track circuit, becomes defective or is being repaired or replaced, the signal associated with the device must be manually caused to display its most restrictive aspect. It is prohibited to permit the signal to display a less restrictive aspect until the device has been restored to its normal operative condition.

CLASSIFICATION OF DEFECTS

- 526.01 Signal not caused manually to display its most restrictive aspect when roadway element associated with such signal is not functioning as intended. (Does not apply to track circuit.)

526.02 Signal which has been caused manually to display its most restrictive aspect when roadway element associated with the signal is not functioning as intended, caused to display a less restrictive aspect before such element has been restored to normal operative condition. (Does not apply to track circuit.)

236.527 Roadway element insulation resistance.

This rule requires insulation resistance between roadway inductor winding and ground shall be maintained at not less than 10,000 ohms.

Application:

Applies to intermittent inductive automatic train stop systems.

This rule applies only to the roadway inductor winding. The insulation resistance of cable or conductors that connect the inductor to its associated signal must comply with the requirements of Rule 236.108.

Disconnect the coil wires and test each to ground. Do not test the coils against each other with an insulation resistance tester.

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Section 236.527 Roadway element insulation resistance.

The present rule applies to intermittent inductive and intermittent magnetic ATS systems. The magnetic train stop is obsolete and is no longer in service in the United States. The FRA proposes to delete the words "or magnetic winding" from this rule.

CLASSIFICATION OF DEFECTS

527.01 Insulation resistance between roadway inductor winding and ground less than 10,000 ohms.

236.528 Restrictive condition resulting from open hand-operated switch; requirement.

This rule requires that the restrictive condition of continuous inductive automatic train stop or train control device or restrictive cab signal indication of an automatic cab signal device be maintained to within 300 feet of an open hand-operated switch or unlocked facing-point lock in equipped territory.

Application:

Applies to continuous inductive automatic train stop, train control and cab signal systems.

This rule requires that switch shunting circuits or switch repeating circuits of hand-operated switch or facing-point lock with circuit controller effectively shunt the track circuit or open the signal control circuits to the extent that the restrictive condition of continuous inductive automatic train stop or train control device or restrictive aspect of cab signal device of an approaching locomotive is maintained to within 300 feet of a facing-point switch opened one-fourth inch or more, a trailing point switch opened three-eighths inch or more, or, a facing-point lock that is not locked.

CLASSIFICATION OF DEFECTS

528.01 Restrictive condition of automatic train stop or train control device of the continuous type on an approaching locomotive not maintained to within 300 feet of the points of a facing-point hand-operated switch which is open one-fourth inch or more.

- 528.02 Restrictive condition of automatic train stop or train control device of the continuous type on an approaching locomotive not maintained to within 300 feet of the points of a trailing-point hand-operated switch which is open three-eighths inch or more.
- 528.03 Restrictive condition of automatic train stop or train control device of the continuous type on an approaching locomotive not maintained to within 300 feet of the points of a hand-operated switch which is not locked, where such switch is equipped with facing-point lock with circuit controller.
- 528.04 Restrictive cab signal indication of automatic cab signal device on an approaching locomotive not maintained to within 300 feet of the points of a facing-point hand-operated switch which is open one-fourth inch or more.
- 528.05 Restrictive cab signal indication of automatic cab signal device on an approaching locomotive not maintained to within 300 feet of the points of a trailing-point hand-operated switch which is open three-eighths inch or more.
- 528.06 Restrictive cab signal indication of automatic cab signal device on an approaching locomotive not maintained to within 300 feet of the points of a switch which is not locked, where such switch is equipped with facing-point lock with circuit controller.
- 236.529 Roadway element inductor; height and distance from rail.

This rule requires that inductors of the inert roadway type be installed and maintained in position in accordance with specifications of the carrier.

Application:

Applies to intermittent inductive automatic train stop systems.

This rule requires that the inductor pole faces be maintained at a height above the plane of the tops of the rails with its inner edge at a horizontal distance from the gage side of the nearest running rail in accordance with the carrier's specifications.

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Section 236.529 Roadway element inductor; height and distance from rail.

The filing of the specifications with the FRA as required by this section serves no useful purpose. The parties recommend the deletion of the words "on file with the FRA" from the last sentence of this rule. The FRA concurs and proposes adoption of the recommended change.

CLASSIFICATION OF DEFECTS

- 529.01 Inductor of the inert roadway element type too high.
- 529.02 Inductor of the inert roadway element type too low.
- 529.03 Inductor of the inert roadway element too close to gage side of nearest running rail.
- 529.04 Inductor of the inert roadway element type too far from gage side of nearest running rail.
- 236.531 Trip arm; height and distance from rail.

This rule requires that trip arm of automatic train stop device, when in stop position, be installed and maintained in position in accordance with specifications of the carrier.

Application:

Applies to mechanical trip type automatic train stop system.

This rule requires that trip arm, when in stop position, be maintained at a height above the plane of the tops of the rails with its centerline at a horizontal distance from the gage side of the nearest running rail in accordance with the carrier's specifications.

CLASSIFICATION OF DEFECTS

- 531.01 Trip arm of automatic train stop device, in stop position, too high.
- 531.02 Trip arm of automatic train stop device, in stop position, too low.
- 531.03 Trip arm of automatic train stop device, in stop position, too close to gage side of running rail.
- 531.04 Trip arm of automatic train stop device, in stop position, too far from gage side of running rail.
- 236.532 Strap iron inductor; use restricted.

This rule restricts the use of strap iron inductors or other roadway element with characteristics different from its standard type.

Application:

Applies to intermittent inductive automatic train stop system.

The use of strap iron inductors or other roadway element with characteristics differing from its standard type is prohibited on track where speed higher than 20 mph is permitted.

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Section 236.532 Strap iron inductor; use restricted.

The FRA proposes to delete from this rule the words "short ramp" because the ramp type of train stop is now obsolete.

CLASSIFICATION OF DEFECTS

532.01 Strap iron inductor or other roadway element with characteristics differing from standard type used on track where speed higher than restricted speed is permitted.

236.534 Entrance to equipped territory; requirements.

This rule requires that where trains are not required to stop at the entrance to equipped territory, except when leaving yards and stations and speed until entering equipped territory does not exceed restricted speed, the automatic train stop, train control, or cab signal device shall be operative at least stopping distance from the entrance to such territory except where the approach thereto is governed by automatic approach signal.

Application:

Applies to automatic train stop, train control, and cab signal systems.

This rule requires that automatic train stop, train control, or cab signal device be operative at least stopping distance from the entrance to equipped territory except where trains are required to stop at the entrance to equipped territory, or the approach thereto is governed by an operative approach signal, or when leaving yards and stations where speed until entering equipped territory does not exceed restricted speed.

CLASSIFICATION OF DEFECTS

534.01 Automatic train stop, train control, or cab signal device not operative at least stopping distance from entrance to equipped territory. (Does not apply where trains are required to stop at entrance to equipped territory or where the approach thereto is governed by automatic approach signal.)

RULES AND INSTRUCTIONS: LOCOMOTIVES

236.551 Power supply voltage; requirement.

This rule prescribes the tolerance within which the power supply voltage shall be maintained.

Application:

Applies to automatic train stop, train control and cab signal systems.

The voltage of the power supply must be maintained to within 10 percent of the rated voltage.

CLASSIFICATION OF DEFECTS

551.01 Voltage of power supply more than 10 percent above rated voltage.

551.02 Voltage of power supply more than 10 percent below rated voltage.

236.552 Insulation resistance; requirement.

This rule prescribes the minimum insulation resistance permitted between wiring and ground.

Application:

Applies to automatic train stop, train control and cab signal systems.

The insulation resistance between wiring and ground of continuous inductive automatic train stop, train control and cab signal systems shall be not less than one (1) megohm when periodic test is completed and not less than 250,000 ohms between periodic tests.

The insulation resistance between wiring and ground of intermittent inductive automatic train stop system shall be not less than 250,000 ohms when periodic test is performed and not less than 20,000 ohms between periodic tests.

Section 236.552 Insulation resistance; requirement.

In the 1939 rules, section 136.8(c)(2) read as follows: "Insulation resistance between wiring when dry and ground shall be not less than 1 megohm."

The 1950 revisions relaxed this requirement to 250,000 ohms for continuous inductive ATS, ATC and ACS, and to 20,000 ohms for intermittent inductive ATS. This was done in response to carrier comments that the one megohm was impossible to maintain since the electrical circuits on the steam locomotives were subject to moisture from steam leaks and severe vibration of the locomotives.

During the informal discussions concerning daily or after trip tests and the periodic tests, insulation resistance was also discussed.

During these informal meetings, the FRA proposed a change in the requirement of section 236.586 be made so that a daily or after trip test would not be required if a periodic test is performed at intervals of not more than two months. The reference to 6,000 miles would be eliminated from section 236.586. The environment on the modern diesel locomotive makes it easier to obtain the higher insulation resistance originally required by the 1939 rules. Therefore, the FRA proposes to raise the insulation resistance requirement to one megohm on continuous inductive ATS, ATC and ACS systems and to 250,000 ohms on intermittent inductive ATS systems at the time the periodic test is made. When the systems are tested between periodic tests, the insulation resistance would be maintained at not less than 250,000 ohms for continuous inductive ATS, ATC and ACS systems, and not less than 20,000 for intermittent inductive ATS.

The parties agree to the proposed changes.

Section 236.552 - Insulation resistance; requirement.

FRA proposed to increase the minimum allowable insulation resistance from 250,000 ohms for continuous inductive ATS, ATC, and ACS systems and 20,000 ohms for intermittent inductive ATS systems to one megohm and 250,000 ohms, respectively, at the time the periodic test prescribed in section 236.588 is made. Between periodic tests, the insulation resistance would be permitted to fall not lower than that currently prescribed. As indicated in the NPRM, the environment of the modern locomotive is highly conducive to achieving these higher safety values.

One commenter opposed this change, stating it would be impossible to bring the commenter's multiple-unit cars into compliance. The ATC system provided on that commenter's M-1 multiple-unit cars is powered from a common battery bus. The commenter has 764 such cars semi-permanently coupled in 382 married pairs. According to the commenter, between April 4 and April 19, 1983, periodic tests were performed on 62 pairs of cars, of which 44 pairs needed repairs to meet the existing minimum of 250,000 ohms. Only one pair was found to meet the one megohm standard.

The commenter acknowledged that with an isolated power supply as proposed in section 236.516, the one megohm standard can be achieved without difficulty. At the present time the commenter is testing a prototype isolated power supply for field reliability. The commenter suggested that installation of an isolated power supply on its equipment would require a five-year overhaul program and that relief from this requirement would be necessary for the duration of the time need to accomplish the overhaul.

FRA is sympathetic to the commenter's dilemma and finds it commendable that the commenter is actively pursuing a resolution to this problem. The concerns of this commenter about achieving effective compliance during a retrofit program lend themselves to resolution via the procedures of section 235.8. Since the commenter's concerns apply to one group of equipment and can be resolved in a separate proceeding, FRA has adopted the provision as proposed.

CLASSIFICATION OF DEFECTS

- 552.01 Insulation resistance between wiring and ground of continuous inductive type automatic train stop, train control, or cab signal device less than 1 megohm not corrected when periodic test is performed.
- 552.02 Insulation resistance between wiring and ground of continuous inductive type automatic train stop, train control, or cab signal device less than 250,000 ohms between periodic tests.
- 552.03 Insulation resistance between wiring and ground of intermittent inductive automatic train stop device less than 250,000 ohms not corrected when periodic test performed.
- 552.04 Insulation resistance between wiring and ground of intermittent inductive automatic train stop device less than 20,000 ohms between periodic tests.
- 236.553 Seal, where required.

This rule requires that a seal be maintained on any device other than brake pipe cutout cock (double heading cock), by means of which the operation of pneumatic portion of automatic train stop or train control apparatus can be cut out.

Application:

Applies to automatic train stop and train control systems.

This rule requires that automatic train stop or train control apparatus be cut in and a seal applied to any device or cutout cock, except double heading cock, by means of which any part of the pneumatic portion of the apparatus can be cut out. The seal is required to be applied in such a manner that the device cannot be operated without breaking the seal.

RULE 136.553

The 1939 rule reads:

AUTOMATIC TRAINSTOP AND TRAIN CONTROL SYSTEMS

* * *

Rules and Instructions, ~~lo~~ocomotive.

553. Seal or lock shall be maintained on apparatus by means of which device can be cut out pneumatically, except double heading cock.

In 1950 the Cab Signal rules were consolidated with the Trainstop and Train Control rules and this rule was revised to the following:

SUBPART E, AUTOMATIC TRAINSTOP, TRAIN CONTROL AND CAB SIGNAL SYSTEMS

* * *

Rules and Instructions, locomotive.

136.553 Seal or lock, where required.-- Seal or lock shall be maintained on any device, other than the double heading cock, by means of which operation of the pneumatic portion of the apparatus can be cut out.

Under the same subpart and caption it would now be revised as indicated by the underlines:

136.553 Seal, where required.-- Seal shall be maintained on any device other than brake pipe cutout cock (double heading cock), by means of which the operation of the pneumatic portion of automatic trainstop or train control apparatus can be cut out.

Through oversight when the cab signal rules were consolidated in 1950 with the trainstop and train control rules, rule .553 was unintentionally made to apply not only to automatic trainstop and train control, but also to cab signal systems, when no such requirement with respect to such systems had existed before. Since there is no footnote to this rule, providing for relief from its requirements upon adequate showing by an individual carrier, it has been necessary to file a formal petition to obtain relief from sealing or locking the whistle cutout cock of an automatic cab signal system. Many of the railroads with automatic cab signal systems in service have filed such petitions for relief and the relief has been granted in every case. Therefore, it is now proposed to revise this section to exclude automatic cab signal systems from the requirements of the rule. Inasmuch as on modern diesel locomotives the device called double heading cock on steam locomotives is referred to as the brake pipe cutout cock, it was decided, in informal conference, that it would be more appropriate to use this term in the rule followed by

the words "double heading cock" in parenthesis. The words "or lock" after the word "seal" in the title of the rule, as first set forth in the Notice of Proposed Rule Making, was left out of the rule as now proposed since no reference is made to lock in the body of the rule. In other words, the phrase "or lock" has been deleted from the present rule since there is only one automatic trainstop or train control device which uses a lock to cut out the pneumatic portion of the equipment, and since the key for this lock is sealed and it is the device by means of which the pneumatic portion is cut out, it is believed that the word "seal" adequately covers the situation.

The RLEA is apprehensive that the whistle feature of this equipment cannot be maintained as well without a seal. They say that if the seal is eliminated from this device, the whistle could be cut out at the will of the engine crew, plus the probability, without a seal to protect it, that it will be accidentally cut out by vibration or by being struck.

Among the railroads having obtained relief from the present Rule 136.553 so as to operate without a seal on the pneumatic portion of its cab signal whistle is the Pennsylvania Railroad Company. On this railroad the cutout cock is positioned in the cab signal whistle pipe so that in the cut-in position the handle is down and parallel with the pipe and vibration would only tend to keep it in that position. The cutout cocks are located in the engineman's compartment close to him.

Discussion and Findings - Rule 136.553. There is some merit to the position of the RLEA that the seal would tend to deter or slow down the temptation to tamper with the brake pipe cutout cock here involved, however, the requirement was only inadvertently ever inserted in the rule and experience to date, at least as far as can be determined on this record, shows no compelling need for it. In the circumstances the examiner is not quite convinced that the seal is necessary and finds that the revision should be approved. Should the future show one necessary or advisable in the interest of safety, the Commission may easily reconsider this requirement.

CLASSIFICATION OF DEFECTS

553.01 Device by means of which operation of pneumatic portion of apparatus can be cut out, not sealed. (Does not apply to brake pipe cutout cock, or double heading cock, of automatic train stop or train control equipped locomotive or to the cutout cock for the pneumatic whistle of an automatic cab signal system on an equipped locomotive.)

236.554 Rate of pressure reduction; equalizing reservoir or brake pipe.

This is a companion rule to Rule 236.508 and requires that the equalizing reservoir pressure or brake pipe pressure reduction during an automatic brake application be at a rate not less than that which results from a manual service application.

Application:

Applies to automatic train stop and train control systems.

An automatic full service brake application is accomplished by piping and venting arrangements different than that accomplished manually. This rule requires that the efficiency of the automatic brake application equal the manual application of the brakes.

CLASSIFICATION OF DEFECTS

554.01 Equalizing reservoir or brake pipe pressure during automatic brake application reduces at a rate less than that which obtains during manual service application.

236.555 Repaired or rewound receiver coil.

This rule requires that a receiver coil which has been repaired or rewound have the same operating characteristics which it possessed originally or as currently specified for new equipment.

Application:

Applies to automatic cab signal, train stop and train control systems.

This rule requires receivers to be rewound with the same size wire and number of turns to achieve the resistive value and inductance it originally possessed or as currently specified for new equipment. The rule prohibits repair of receivers by removing turns of wire to eliminate shorts or opens.

CLASSIFICATION OF DEFECTS

555.01 Receiver coil which has been repaired or rewound does not have same operating characteristics which it possessed originally or as currently specified for new equipment.

236.556 Adjustment of relay.

This rule prohibits the adjustment of a relay elsewhere than in a shop equipped for that purpose except when receiver coils, electro-pneumatic valve or other essential part of the equipment is replaced.

Application:

Applies to automatic cab signal, train stop, and train control systems.

This rule requires that adjustment of relay be made only in a shop equipped for that purpose except when receiver coils, electro-pneumatic valve or other essential part of the equipment is replaced. The rule prohibits adjustment of the relay to compensate for irregularities in power supply voltage or other variable factors in its circuit.

CLASSIFICATION OF DEFECTS

556.01 Change in adjustment of relay made elsewhere than in a shop equipped for that purpose. (Does not apply when receiver coils, electro-pneumatic valve, or other essential part of equipment is replaced.)

556.02 Relay adjusted to compensate for irregularities of power-supply voltage or other variable factors in circuit.

236.557 Receiver; location with respect to rail.

This rule requires that the receiver of an intermittent inductive automatic train stop device or the receiver of a continuous inductive automatic train stop, train control or cab signal device on locomotive equipped with onboard test device be maintained in accordance with specifications of the carrier.

Application:

Applies to all intermittent inductive automatic train stop systems and to those continuous inductive automatic train stop, train control or cab signal devices that are installed on locomotives equipped with onboard test device. This rule requires that

the receiver of covered devices be maintained with bottom of the receiver at a height above the plane of the tops of the rails and with its outer edge at a horizontal distance from the gage side of the nearest rail in accordance with specifications of the carrier.

Section 236.557 - Receiver, intermittent inductive; location with respect to rail.

The FRA proposed to revise this section by deleting the requirement that carriers file with FRA their specifications for mounting the receivers on locomotives. One commenter noted that use of an onboard test device instead of a wayside device no longer determines that receiver heights of continuous inductive devices are in proper relationship with the rails. Thus, a device successfully tested by onboard equipment may not respond to the wayside equipment in equipped territory because one or both receivers are too far removed from the rails, or a noncoded device having receivers too close to the rails may be coupled to an extraneous signal to produce a false proceed cab signal aspect.

FRA agrees with the commenter's analysis that continuous inductive systems receivers too far removed from the rail will cause the device to display a restrictive aspect. In that event the device would be cut out and the train movement continued under provisions of section 236.567. While considered safe, such failures are undesirable. In coded continuous inductive coded systems, receivers too close to the rails present no hazards because the code rate assures that the coupling to the wayside apparatus is correct. However, as previously stated, noncoded continuous inductive systems with receivers too close to the rails could be improperly coupled to produce a false proceed cab signal.

FRA has taken the commenter's recommendation into consideration and will recaption section 236.557 and revise it to require receivers of continuous inductive ACS, ATS, or ATC devices on locomotives having onboard test equipment to be maintained at proper height above the rails.

NPRM
Federal Register
March 21, 1983

Section 236.557 Receiver, intermittent inductive; location
with respect to rail.

Since the words "on file with the FRA" impose an unnecessary paperwork burden on the railroads, the FRA proposes to delete that phrase from this rule.

CLASSIFICATION OF DEFECTS

- 557.01 Receiver of intermittent inductive automatic train stop device of the inert roadway element type, or continuous inductive automatic train stop, train control, or cab signal device on locomotive equipped with onboard test device, too high.
- 557.02 Receiver of intermittent inductive automatic train stop device of the inert roadway element type, or continuous inductive automatic train stop, train control, or cab signal device on locomotive equipped with onboard test device, too low.
- 557.03 Receiver of intermittent inductive automatic train stop device of the inert roadway element type, or continuous inductive automatic train stop, train control, or cab signal device on locomotive equipped with onboard test device, too close to gage side of nearest rail.
- 557.04 Receiver of intermittent inductive automatic train stop device of the inert roadway element type, or continuous inductive automatic train stop, train control, or cab signal device on locomotive equipped with onboard test device, too far from gage side of nearest rail.
- 236.560 Contact element, mechanical trip type; location with respect to rail.

This rule requires that the contact element of automatic train stop device of the mechanical trip type be maintained in accordance with specifications of the carrier.

Application:

Applies to mechanical trip type automatic train stop systems.

This rule requires that the contact element of automatic train stop device of the mechanical trip type be installed and maintained at a height above the tops of the plane of the rails and at a horizontal distance from the nearest rail in accordance with specifications of the carrier.

NPRM
Federal Register
March 21, 1983

Section 236.560 Contact element, mechanical trip type;
location with respect to rail.

The parties proposed the words "on file with the FRA" be deleted from the last sentence of this rule.

The FRA agrees with the interested parties that the requirement to file this information with the FRA serves no useful purpose. The deletion of this requirement would relieve the carriers of an unnecessary burden. The FRA proposes to delete the words "on file with the FRA" from the last sentence of the rule.

CLASSIFICATION OF DEFECTS

560.01 Contact element of automatic train stop device of the mechanical trip type too high.

560.02 Contact element of automatic train stop device of the mechanical trip type too low.

560.03 Contact element of automatic train stop device of the mechanical trip type too close to gage side of rail.

560.04 Contact element of automatic train stop device of the mechanical trip type too far from gage side of rail.

236.562 Minimum rail current required.

This rule requires that the minimum pick-up value of the locomotive apparatus be maintained in accordance with specifications of the carrier.

Application:

Applies to continuous inductive automatic cab signal, train stop and train control systems.

This rule requires that minimum rail current required to restore the locomotive equipment of continuous inductive automatic train stop or train control device to normal condition, or to obtain a proceed indication of automatic cab signal device be in accordance with specifications of the carrier.

NPRM
Federal Register
March 21, 1983

Section 236.562 Minimum rail current required.

The parties suggested words "on file with the FRA" be deleted from this rule.

The FRA agrees with the interested parties that the requirement to file this information with the FRA serves no useful purpose and is an unnecessary burden on the carriers. Therefore, the FRA proposes to delete the words "on file with the FRA" from the last sentence of this rule.

CLASSIFICATION OF DEFECTS

562.01 Pick-up of locomotive equipment of continuous inductive automatic train stop, train control, or cab signal device too high.

562.02 Pick-up of locomotive equipment of continuous inductive automatic train stop, train control, or cab signal device too low.

236.563 Delay time.

This rule prescribes that the delay time of automatic trainstop or train control system not exceed 8 seconds and that the spacing of signals to meet the requirements of Rule 236.24 take into consideration the delay time.

Application:

Applies to continuous inductive automatic train stop and train control systems.

Delay time is provided to give the engineer time to take proper action to prevent an automatic brake application. This rule prohibits the delay time from exceeding eight seconds before the brakes begin to apply. The rule also requires that spacing of signals in equipped territory include the distance traveled at maximum authorized speed for eight seconds in order that trains may be stopped by the automatic brake application at the signal where a stop is required, or by reduction in speed to the rate prescribed by the next signal in advance where reduced speed is required.

CLASSIFICATION OF DEFECTS

563.01 Delay time of automatic train stop or train control system exceeds 8 seconds.

563.02 Spacing of signals to meet the requirements of Section 236.24 of the Rules, Standards and Instructions not adequate in consideration of delay time during automatic train stop or train control brake application.

236.564 Acknowledging time.

This rule prescribes that the acknowledging time of intermittent automatic train stop device not exceed 30 seconds.

Application:

Applies to intermittent inductive automatic train stop systems.

Acknowledging time is provided in order to give the engineer sufficient time to forestall an automatic brake application of a restricting signal. This rule prohibits the acknowledging lever from being held in the acknowledging position longer than 30 seconds before the brakes apply.

The 1939 rules required:

AUTOMATIC TRAIN STOP AND TRAIN CONTROL SYSTEMS

* * *

Rules and Instructions - Locomotive.

564. Delay time shall not be of such duration (preferably not more than 6 seconds) as to prevent train from being stopped from maximum authorized speed within braking distance provided.

The present 1950 rule reads:

SUBPART E, AUTOMATIC TRAIN-STOP, TRAIN CONTROL AND CAB SIGNAL SYSTEMS

* * *

Rules and Instructions, locomotives

* * *

136.564 Acknowledging time.--
Acknowledging time of intermittent automatic train-stop device shall be not more than 20 seconds.

The proposed revision, with change underlined, follows:

136.564 Acknowledging time.--
Acknowledging time of intermittent automatic train-stop device shall be not more than 30 seconds.

In intermittent inductive automatic train-stop systems an acknowledgement device is provided by means of which an automatic brake application is prevented if the acknowledging device is operated as the locomotive receiver is passing over an inductor or magnet in stop condition. In order to preclude the possibility of the handle of the acknowledging device being left inadvertently in acknowledging position or being intentionally secured in that position at all times, means are provided to initiate an automatic brake application if the handle of the device remains in acknowledging position for longer than a pre-determined period, usually of from 15 to 20 seconds. This insures that the engineman is given sufficient time upon approaching a restrictive signal to operate the handle of the acknowledging device before passing the signal, so that the acknowledging contact will be closed when the receiver passes over the track element, but at the same time prevents him from securing the handle in the acknowledging position or from inadvertently allowing it to remain in that position, since after the expiration of this predetermined time either an

automatic brake application will occur, or subsequent acknowledgment will not be effective. In one type of intermittent inductive automatic train-stop device, a pneumatic relay, operated by air at main reservoir pressure from a small reservoir, is used to effect acknowledgement. The acknowledging time is determined by the period of time required to exhaust the air in this reservoir through a restricted orifice in the diaphragm chamber of the pneumatic relay, the air being admitted to the relay by operating the handle of a small valve, called the acknowledging valve. The time during which the contacts of this relay remain closed during acknowledgment varies, therefore, with the main reservoir pressure, all other conditions being equal, it being longer on engines where higher main reservoir pressure is carrier than on those engines with a lower main reservoir pressure. There has been a tendency to increase main reservoir pressures, especially on passenger locomotives, so that today, the operating time of this relay may be as long as 25 or 30 seconds. Since safety is not adversely affected by lengthening the acknowledging time the rule has been revised to increase the prescribed time from 20 to 30 seconds, in order to provide for the variation in time resulting from increased main reservoir pressures. The acknowledging time has no effect whatsoever upon stopping distance, in the event of an automatic brake application initiated by the automatic train-stop device.

While the RLEA does not support the change in this rule, it does not oppose it and adduced no evidence on it. The Examiner finds for its approval.

CLASSIFICATION OF DEFECTS

564.01 Acknowledging time of intermittent automatic train stop device exceeds 30 seconds.

236.565 Provision made for preventing operation of pneumatic brake-applying apparatus by double-heading cock; requirements.

This rule requires that where provision is made for preventing the operation of the pneumatic brake-applying apparatus of an automatic train stop or train control device when the double-heading cock is placed in double-heading position, the double-heading cock shall be so arranged that the automatic brake valve is cut out in advance of or simultaneously with the train stop or train control apparatus.

Application:

Applies to automatic train stop and train control system.

This rule prohibits operation of the double-heading cock to the extent that the automatic train stop or train control pneumatic apparatus is rendered inoperative before the automatic brake valve.

CLASSIFICATION OF DEFECTS

565.01 Automatic train stop or train control device is cut out before communication is closed between engineer's automatic brake valve and the brake pipe, when operating double-heading cock toward double-heading position.

236.566 Locomotive of each train operating in train stop, train control or cab signal territory; equipped.

This rule requires that the locomotive, from which brakes are controlled, of each train operating in automatic train stop, train control or cab signal territory shall be equipped with apparatus responsive to the roadway equipment installed on all or any part of the route traversed, and such apparatus shall be in operative condition.

Application:

Applies to automatic cab signal, train stop and train control systems.

This rule requires that each locomotive from which the brakes are controlled which traverses automatic train stop, train control or cab signal territory be equipped with apparatus responsive to the roadway equipment installed on all or any part of the route traversed. The rule further requires that the apparatus of the locomotive be in operative condition upon departure from its initial terminal.

Rule 566

Objections to this rule were filed by the Union Pacific, Santa Fe, Burlington, and Chicago, Milwaukee, St. Paul and Pacific, hereinafter referred to as the Milwaukee. The rule requires that all locomotives operated in automatic train-stop, train-control, or cab-signal territory be equipped with apparatus responsive to the roadway equipment and that such apparatus be in operative condition. The Commission has heretofore granted relief from this requirement where locomotives operated in train-stop, train-control, or cab-signal territory short distances, and the note to which the rule is subject contemplates that in the future relief from the requirements of the rule will be warranted in some instances. In the fourth and seventh reports on further hearing in Appliances and Systems to Promote Safety of Operation, 274 I. C. C. 628, and 276 I. C. C. 798, the requirement for installation of automatic train-stop, train-control, or cab-signal devices on freight locomotives was postponed until the further order of the Commission in the case of the Santa Fe and the Union Pacific, respectively. The Burlington and the Milwaukee have pending in that proceeding petitions for similar relief. The objections to this rule will be met by adding the following to the note to the rule:

Relief heretofore granted to any carrier by order of the Commission shall constitute relief to the same extent from the requirements of these rules.

CLASSIFICATION OF DEFECTS

- 566.01 Locomotive from which brakes are controlled on train operating in automatic train stop, train control, or cab signal territory not equipped with apparatus responsive to roadway equipment installed on all or any part of route traversed.
- 566.02 Automatic train stop, train control, or cab signal apparatus on locomotive from which brakes are controlled of train operating in automatic train stop, train control, or cab signal territory not in operative condition.

236.567 Restrictions imposed when device fails and/or is cut out en route.

This rule sets forth the procedures and restrictions that shall be followed when an automatic train stop, train control or cab signal device fails and/or is cut out en route.

Application:

Applies to automatic cab signal, train stop and train control systems.

This rule requires that when an automatic cab signal, train stop or train control device fails or is cut out en route the train shall proceed not exceeding 20 miles per hour, or, if an automatic block signal system is in operation, according to signal indication not exceeding 40 miles per hour, to the next available point of communication where a report must be made to a designated officer. Radio communications are permissible for this purpose.

Following the required report, in the event the train is in territory in which an automatic block signal system is not in use, the train may be permitted to proceed at not exceeding 20 miles per hour to a point where an absolute block is established.

In the event an automatic block signal system is in operation in the territory in which the train is operating, the train may be permitted to proceed according to signal indication at not exceeding 40 miles per hour to a point where an absolute block is established.

Upon establishment of an absolute block in front of the train with the inoperative device, the train may then proceed at speeds not in excess of 79 miles per hour.

The carrier's operating rules shall effect these requirements.

Rule 567

Objections to this rule were filed by the Union Pacific, Santa Fe, Burlington, Milwaukee, and Illinois Central. Their objections relate only to the last sentence of the rule which reads as follows:

Where an absolute block is established to advance of and for the train on which the device is inoperative and an automatic block signal system is not in use, train may proceed at medium speed and where an automatic block signal system is in operation, train may proceed on signal indications but not to exceed 80 miles per hour.

In the rules an absolute block is defined as a block in which no train is permitted to enter while it is occupied by another train, and medium speed is defined as a speed not exceeding 40 miles per hour.

One of the objections to this rule is based on the thought that the rule requires that the absolute block referred to be a manual block. Clearly, the rule does not so provide. An absolute block can be established by the use of automatic signals, as well as by manual block operators. For example, if the aspects of automatic signals that ordinarily indicate "stop and proceed" are made to indicate "stop" for a train on which the train-stop, train-control, or cab-signal devices have failed or been cut out en route, and the train required to stop until an aspect indicating that it might proceed is shown, an absolute block in advance of that train within the meaning of this rule would thereby be established. When the rule was thus explained at the hearing for cross-examination, the greater part of the objections to it were satisfied.

Another objection was to the words "and for," it being thought that their use meant that an absolute block had to be established in the rear as well as in advance of the train. This was not the intent of the rule, but as it is possible to so interpret it, these words will be eliminated.

The only other objections to the rule is the differentiation in speeds at which a train may proceed after an absolute block has been established dependent upon whether or not an automatic block system is in use. This objection is raised by the Santa Fe and the Illinois Central. The former has in operation a train-control system on its double-track line between Pequot, Ill., and Fort Madison, Iowa, 175.4 miles, and the latter has in operation an automatic train-stop system on its double-track line between Champaign, Ill., and Branch Junction, Ill., 122 miles, and on its single-track line between Waterloo, Iowa, and Fort Dodge, Iowa, 97 miles. There are no automatic wayside block signals on any of these lines, and when the train-control or train-stop devices fail or are cut out en route an absolute manual block in advance of the train is established and the train then permitted to proceed at the maximum authorized speed. They desire to continue this practice, but have no objection to limiting the speed to a maximum of 79 miles per hour. It is their contention that when an absolute block is established the maximum permitted speed should be the same, whether the absolute block is a manual block or an automatic block. There is merit in this contention as the protection afforded by an absolute block would be substantially the same whether the absolute block is a manual block or an automatic block.

At the hearing for cross-examination it developed that all of the objections to this rule would be removed if the last sentence quoted above were changed to read:

Where an absolute block is established in advance of the train on which the device is inoperative, train may proceed at not to exceed 79 miles per hour.

Such change will be made in the rule.

The proposed rules, standards and instructions, with the changes herein indicated above are approved. An appropriate order will be entered.

CLASSIFICATION OF DEFECTS

- 567.01 Train permitted to proceed at higher than restricted speed to next available point of communication when automatic train stop, train control, or cab signal device fails and/or is cut out en route and no automatic block signal system is in operation.
- 567.02 Train permitted to proceed at higher than medium speed to next available point of communication when automatic train stop, train control, or cab signal device fails and/or is cut out en route and automatic block signal system is in operation.
- 567.03 Report not made to designated officer at next available point of communication after automatic train stop, train control, or cab signal device fails and/or is cut out en route.
- 567.04 Train permitted to proceed at higher than restricted speed to point where absolute block can be established when automatic train stop, train control, or cab signal device fails and/or is cut out en route and no automatic block signal system is in use.
- 567.05 Train permitted to proceed at higher than medium speed to point where absolute block can be established when automatic train stop, train control, or cab signal device fails and/or is cut out en route and an automatic block signal system is in use.
- 567.06 Train permitted to proceed at a speed exceeding 79 miles per hour where automatic train stop, train control, or cab signal device fails and/or is cut out en route when an absolute block is established in advance of the train on which the device is inoperative.
- 236.568 Difference between speeds authorized by roadway signal and cab signal; action required.

This rule requires that in the event a cab signal authorizes a speed different from that authorized

by a roadway signal, the most restrictive speed shall not be exceeded.

Application:

Applies to continuous inductive automatic cab signal, train stop, and train control systems.

This rule requires that if for any reason a cab signal authorizes a speed different from that authorized by a roadway signal, when a train enters the block governed by the signal, the lower speed shall not be exceeded.

The carrier's operating rules shall effect this requirement.

CLASSIFICATION OF DEFECTS

- 568.01 Train operated at a speed higher than that authorized by the more restrictive indication when the speed authorized by the cab signal indication is different than that authorized by the indication of the roadway signal when train entered block governed by such signal.

INSPECTIONS AND TESTS: ROADWAY

- 236.576 Roadway element.

This rule requires that roadway elements, except track circuits, including those for test purposes, shall be gaged monthly for height and alinement, and shall be tested at least every 6 months.

Application:

Applies to automatic train stop systems.

This rule requires that inductor of the inert roadway type and trip arm be gaged monthly for height and alinement. The rule further requires testing of inductor for defective conditions in its windings or external controlling circuit and of trip arm valves and return springs every six months.

RULE 136.576

The 1939 rules required:

AUTOMATIC TRAIN STOP AND TRAIN CONTROL SYSTEMS

Inspections and Tests - Roadway

576. The inspections and test prescribed in sections 101 to 200 inclusive, insofar as they are applicable, shall apply to roadway installations or automatic train stop and train control systems, and in addition the following:

577. Roadway elements shall be inspected frequently enough to insure that they are in good condition. They shall be gaged monthly for height and alinement, and shall be tested semi-annually to insure that they are in condition for reliable and safe operation. Roadway elements found to be defective shall be replaced with elements known to be in good condition.

The present rule, approved in 1950, reads as follows:

SUBPART E, AUTOMATIC TRAIN-STOP, TRAIN-CONTROL
AND CAB-SIGNAL SYSTEMS

Inspections and tests, roadway

136.576 Roadway element.--Roadway elements, including those for test purposes, shall be gaged monthly for height and alinement, and shall be tested at least once every 6 months.

The proposed rule, with changes underlined, follows:

136.576 Roadway element.--Roadway elements, except track circuits, including those for test purposes, shall be gaged monthly for height and alinement, and shall be tested at least every 6 months.

The purpose of this revision is to exempt track circuits from the requirements of testing roadway elements of automatic train-stop, train-control, and cab-signal systems, because it was not the intent of the rule, and it has never been so interpreted, to require track circuits to be tested every 6 months. The Commission's definition for roadway element includes electric circuit, and since a track circuit is an electric circuit the rule, as presently in effect, could be interpreted to require that track circuits shall be tested at least every six months, and as above stated, it was not intended that track circuits be so tested. The reason is that a track circuit, like most other components of a signal system, operates on the closed-circuit or fail-safe principle, meaning that failure of any part of the circuit will result in a

restrictive operation of the system of which the track circuit is a part. In the case of a continuous inductive automatic train-stop, train-control or cab-signal system, failure of the track circuit will result in a restrictive cab-signal indication on a locomotive, and in a train-stop or train-control system initiation of an automatic brake application. On the other hand, intermittent inductive automatic train-stop systems which employ roadway elements consisting of inert inductors do not operate on the closed circuit or fail-safe principle, and accordingly are not self-checking, like a track circuit. A short-circuit in the internal winding of an inductor or a cross or combination of grounds in its external controlling circuit, could result in a false-proceed condition of the inductor which would not be detected by the locomotive equipment as in the case of a continuous inductive device employing track circuits. Consequently, when an equipped locomotive passes over an inductor in such condition, if the signal were displaying a restrictive aspect, an automatic brake application would not be initiated, resulting in a false-proceed operation of the system. Accordingly, in order to minimize the probability of such failures, the inductors and their controlling circuits must be frequently checked and Section 136.576 requires that these tests be made at least once every six months.

Again, the RLEA does not concur in the proposed revision, but if offered no opposing evidence on it. The Examiner finds that this rule should be revised as proposed.

CLASSIFICATION OF DEFECTS

- 576.01 Roadway element not gaged monthly for height and alinement.
- 576.02 Roadway element not tested at least once every six months.
- 236.577 Test, acknowledgement and cut-in circuits.

This rule requires that test, acknowledgement and cut-in circuits shall be tested at least once every twelve months.

Application:

Applies to automatic cab signal, train stop and train control systems.

This rule requires test at least once every twelve months of test circuits, including test equipment, acknowledgement and cut-in circuits.

An acknowledgement circuit is installed between the track rails at each signal or stop indication point in territory where an automatic trainstop or cab signal system of the continuous inductive type with two-indication cab signals is in service, to enforce acknowledgement by the engineer of restrictive conditions in order to forestall an automatic brake application. The acknowledgement circuit is required to be continuously energized and, if interrupted, it must deenergize its associated track circuit.

A cut-in circuit is a roadway circuit located at the entrance of equipped territory by means of which locomotive equipment of continuous inductive type system is actuated so as to be in an operative condition. The cut-in circuit shall be so arranged that it requires acknowledgement by the engineer of all restrictive features provided by the device.

Test circuits, including portable and onboard test equipment, may be used for performing the prescribed tests of apparatus on equipped locomotives.

Section 236.577 Test, acknowledgement and cut-in circuits.

The current provisions of this section require that test, acknowledgement and cut-in circuits at test points along the wayside or on equipped locomotives that are used to determine the onboard equipment is functioning as intended be tested for proper calibration at least once every six months. The FRA proposes to lengthen this periodic test requirement to once every twelve (12) months. Based on the FRA's experience, the modern apparatus that controls these circuits do not vary from proper calibration often enough to justify testing once every six months.

During shipment this equipment is often subjected to damage that affects calibration. This damage is more likely to be cause for repairs than the proposed extended test period. This change should reduce the number of spare test units affected carriers are now required to have on hand in order to comply with the existing provisions.

CLASSIFICATION OF DEFECTS

- 577.01 Test circuit not tested at least once every twelve months.
- 577.02 Acknowledgement circuit not tested at least once every twelve months.
- 577.03 Cut-in circuit not tested at least once every twelve months.
- 577.04 Onboard test equipment not tested at least once every twelve months.
- 236.586 Daily or after trip test.

This rule prescribes inspection and test daily or after each trip of the automatic train stop, train control or cab signal apparatus on each locomotive operating in equipped territory, except where periodic tests are performed on such locomotives at intervals or not more than two months.

Application:

Applies to automatic cab signal, train stop and train control systems.

This rule requires that the automatic train stop, train control or cab signal apparatus on each locomotive operating in equipped territory be inspected and tested either once every 24 hours or within 24 hours before departure on each trip. Daily or after trip inspections and tests are not required for locomotives which are subjected to periodic tests at intervals of not more than two months.

The purpose of the test is to determine the device is functioning properly before being dispatched into equipped territory. The test is required to be made by an employee capable of detecting defective conditions and taking corrective action prior to the locomotive being dispatched from its initial terminal. In all systems the daily or after trip test shall consist of a general

inspection of the apparatus for evidence of damage or wear and a complete cycle of the system's functions, in addition to the following:

In intermittent inductive automatic train stop system, the test shall determine if the apparatus is properly sensitive, that an automatic application can be forestalled, that an automatic application causes a full service application, that the brakes cannot be released during an automatic application until sufficient time has elapsed to stop a train from maximum authorized speed (reset time), and that seals are properly applied unless device is to be cut out between initial terminal and equipped territory.

In continuous inductive automatic train stop system, the test shall determine that an automatic application can be forestalled, that an automatic application causes a full service brake application, that the brakes cannot be released during an automatic application until sufficient time has elapsed to stop a train from maximum authorized speed (reset time) or the condition that caused the automatic application ceases to exist, and in noncoded continuous inductive automatic train stop system that pick-up of the device is within specified limits, and that seals are properly applied unless device is to be cut out between initial terminal and equipped territory.

In continuous inductive automatic train control systems, the test shall determine that overspeed causes an automatic brake application unless suppressed, that an automatic application causes a full service brake application, that the brakes cannot be released during an automatic application until sufficient time has elapsed to stop a train from maximum authorized speed (reset time), or the condition that caused the automatic application ceases to exist, and in noncoded continuous inductive automatic train control system, that pick-up of the device is within specified limits, and that seals are properly applied unless device is to be cut out between initial terminal and equipped territory.

In automatic cab signal system, the test shall determine that cab signal indications correspond to proper codes or track conditions, that the audible indicator has a distinctive sound and can be heard clearly throughout the cab and that the audible indicator sounds continuously until silenced manually each time the cab signal changes to a more restrictive indication.

Results of the daily or after trip test are required to be recorded by Rule 236.110.

Section 236.586 Daily or after trip tests.

The caption of this rule is derived from the time frame in which the test may be performed -- either daily before departure of the equipped locomotive from its initial terminal or immediately upon completion of a trip by the equipped locomotive. The current provisions of this section require that each locomotive operating in equipped territory be tested either once every 24 hours or within 24 hours before departure upon each trip. There is an exception provided from these requirements for diesel-electric and electric locomotives where the periodic test prescribed in section 236.588 is performed each 6000 miles or at intervals of not more than two (2) months, whichever shall occur first.

The FRA finds section 236.586 imposes the largest burden of all reporting requirements contained in the RS&I. Accordingly, during the informal meetings, the interested parties labored long to reduce that burden without affecting the level of safety provided by the existing requirements. During deliberations they concluded that a need exists for all equipped locomotives to be inspected visually for damage that may have resulted on the previous trip caused by such things as chafing of cables as a result of loosened fasteners or brackets or damage inflicted by flying debris beneath the locomotive. They also determined that measurement of power supply voltages and insulation resistance values could be deleted from the test until such time as the need may show they should be reinstated. Further, they concluded that since automatic cab signal systems depend on a modulated carrier received from the track circuit, the test of pick-up value of coded cab signals could be deleted. The proposed changes are premised on each equipped locomotive being inspected and tested by an employee capable of detecting

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defective conditions and taking corrective action prior to the locomotive being dispatched from its initial terminal.

Accordingly, the FRA proposes to require daily or after trip test except where tests prescribed by section 236.588 are performed at intervals of not more than two months. The proposal will require the inspection and test to be made each calendar day or within 24 hours before departure upon each trip. Revised section 236.586 would require the apparatus of locomotives equipped with intermittent inductive ATS, non-coded continuous inductive ATS or ATC to be tested to determine the pickup of the device is within specified limits and responsive to wayside equipment. In addition, the proposed change would require such equipment to be cycled to determine that it functions as intended.

The interested parties concur and the FRA proposes to revise this section accordingly.

Section 236.586 - Daily or after trip test.

FRA proposed to revise this section to clearly require a daily visual inspection together with a test to determine the locomotive device is properly responsive to wayside equipment. In addition, intermittent inductive non-coded ATS and continuous inductive non-coded ATS or ATC systems must be tested for sensitivity.

One commenter suggested the proposed rule does not clearly establish what tests are required and recommended the rule be restructured for clarity. In adopting the final rule, FRA decided to incorporate the suggestion that the rule be restructured into three paragraphs. FRA made this change to improve the logic of the regulatory text and to avoid any possible confusion about the required tests. This change, which should resolve the potential confusion pointed out by the commenter, has necessitated restructuring proposed paragraph (b) to make the last sentence paragraph (b) of the final rule and the first sentence paragraph (c) of the final rule.

CLASSIFICATION OF DEFECTS

- 586.01 Automatic train stop, train control, or cab signal apparatus on locomotive operating in equipped territory not tested either once every 24 hours or within 24 hours before departure on each trip. (Does not apply to locomotive on which periodic test is made at least once every two months.)

236.587 Departure test.

This rule requires that the automatic train stop, train control, or cab signal apparatus on each locomotive be tested prior to entering equipped territory to determine if such apparatus is in service and functioning properly.

Application:

Applies to automatic cab signal, train stop, and train control systems, except automatic train stop system of the mechanical trip type.

The rule requires the departure test be made on departure of the locomotive from its initial terminal and equipped territory. If the apparatus is cut out between the initial terminal and equipped territory, the departure test must be made prior to entering equipped territory.

The purpose of the test is to determine the apparatus is in service and is functioning properly.

The rule permits departure tests to be made over track elements or test circuits permanently installed for that purpose, or with portable test equipment, or with onboard test equipment. In any case, it must be so arranged that it will produce any of the various track circuit conditions encountered in actual service.

If a locomotive makes more than one trip in a 24-hour period only one departure test is required in such 24-hour period.

The rule requires that where the departure test is performed by an employee other than the engineer, the engineer shall be informed of the results of the test and a record kept thereof.

(1) Whoever performed the test shall certify in writing that such test was properly performed. The certification and the test results shall be posted in the cab of the locomotive and a copy of the certification and the test results left at the test location for filing in the office of the supervisory official having jurisdiction.

(2) If it is impractical to leave a copy of the certification and test results at the location of the test, the test results shall be transmitted to either (i) the dispatcher or (ii) one other designated individual at each location who shall keep a written record of the test results and the name of the person performing the test. These records shall be retained for at least 92 days.

The 1939 rules provide:

AUTOMATIC TRAIN STOP AND TRAIN CONTROL SYSTEMS

* * *

Inspections and tests - locomotive

* * *

Section 136.587. Departure test over track elements or test circuits, except locomotives and multiple-unit cars equipped with mechanical trip stop, shall be made by an employee assigned to perform such tests, on departure from initial locomotive terminal or before entering equipped territory, to insure that the device is in service and is functioning properly. If departure test is made by employee other than engineman, record of operative condition shall be made on a form provided for that purpose. Locomotive shall not be dispatched from locomotive terminal for movement over equipped territory when device is not in proper operative condition, except locomotive used as helper from which brakes are not controlled or operated and except when authorized by the Commission. If the engineman takes charge of locomotive en route in equipped territory, he shall know whether or not the device is in service.

The present rule reads:

SUBPART E, AUTOMATIC TRAIN-STOP, TRAIN CONTROL AND CAB SIGNAL SYSTEMS

* * *

Inspections and tests, locomotive

* * *

136.587 Departure test.--A test of the automatic train-stop, train-control, or cab-signal apparatus on each locomotive, except locomotives and multiple unit cars equipped with mechanical trip stop, shall be made over track elements or test circuits on departure of locomotive from its initial terminal and, if locomotive apparatus is cut out between initial terminal and equipped territory, immediately prior to entering equipped territory, to determine if such apparatus is in service and is functioning properly. If such departure test is made by an employee other than engineman, the engineman shall be informed of the results of such test and a record kept thereof.

The proposed rule, under the same Subpart and Caption, provides with changes underlined:

136.587 Departure test.--A test of the the automatic train-stop, train-control, or cab-signal apparatus on each locomotive, except locomotive and multiple-unit cars equipped with mechanical trip stop only, shall be made over track elements or test circuits or with portable test equipment, either on departure of locomotive from its initial terminal or, if locomotive apparatus is cut out between initial terminal and equipped territory,

prior to entering equipped territory, to determine if such apparatus is in service and is functioning properly. If a locomotive makes more than one trip in any 24-hour period only one departure test shall be required in such 24-hour period. If departure test is made by an employee other than engineman, the engineman shall be informed of the results of such test and a record kept thereof.

The important point in the 1939 rule, compared to the present, is that the rule requiring departure tests of automatic train-stop, train-control and cab-signal equipment was included in the 1939 rules, but the present rule required that departure test be made either on departure of the locomotive from its initial terminal or before entering equipped territory, whereas the present rule requires that such tests be made on departure from the initial terminal, as well as before entering equipped territory, if the device is cut out between initial terminal and equipped territory. Now, it is contended that if the apparatus is tested immediately before entering equipped territory, after having been cut out since leaving the initial terminal, that the departure test which was made at that point serves no useful purpose and could properly be dispensed with. With the advent of the diesel locomotive, some engines may run as much as 2,000 miles after leaving their initial terminal before entering equipped territory, and obviously it would neither be practical nor economical to leave the equipment cut in for that distance after having made the departure test upon leaving the initial terminal. Therefore the equipment is cut out and must be tested again upon entering equipped territory. It is therefore suggested the rule now be revised to permit a departure test to be made either on departure of the locomotive from its initial terminal or, if locomotive apparatus is cut out between initial terminal and equipped territory, prior to entering equipped territory instead of at both places as now required, when the equipment is cut out after leaving the initial terminal. The proposed rule also provides that if a locomotive makes more than one trip in any 24-hour period, only one departure test shall be required in such 24-hour period. This provision eliminates the necessity of making several departure tests a day on those locomotives and self-propelled passenger cars used in suburban or turn-around service which made several round trips between the same two points daily. Often it is impracticable to provide the necessary facilities for making departure tests at one or the other terminals for such trains.

With the advent of the diesel locomotive many of the troubles prompting need for frequent testing under the steam locomotive have been eliminated. The energy for operation of the train-control or cab-signal equipment is obtained from a motor-generator, and these circuits thus are isolated from all other locomotive circuits. There is no steam or water to induce grounds and there is little vibration to cause wires to break and connections to become loose. Further, in the years since this rule first went into effect the insulation of wires and cables has been greatly improved and new techniques have been developed to insulate exposed parts such as receivers so as to eliminate almost entirely the probability of grounds and crosses occurring in these vital parts.

In continuous inductive automatic train-stop, train-control and cab-signal systems further advancements have been made, such as the substitution of transistors for electronic tubes in the amplifiers. This change alone has eliminated the source of frequent failures caused by tubes burning out or becoming low in emission. This improvement has also made possible the elimination of the dynamotor, which was necessary as a source of 350-volt energy for the plate

circuits of the amplifier tubes, and which was a constant source of failures. All of these improvements have greatly decreased the probability of failure of automatic train-stop, train-control, and cab-signal equipment on the locomotive and accordingly the need for frequent testing has proportionately been reduced. In any event when a device fails enroute, since under the provisions of Section 136.567, sufficient restrictions are imposed to insure safety of operation in the event of such a contingency.

The proposed rule also permits use of portable test equipment for making departure tests, which is not allowed in the present rule. The Bureau has received numerous requests for relief from the requirements of Section 136.587 to the extent that portable test equipment may be used instead of track elements or permanent test circuits where it was either impracticable or uneconomical to provide permanent track elements or test circuits and all such individual requests have been granted. Such portable test equipment has been found to be just as reliable and efficient as permanent installations.

The RLEA is particularly apprehensive about the use of portable equipment in complying with this rule. And the reason for their apprehension in this respect is that they fear the use of the portable equipment by inexperienced personnel. If given assurance that portable equipment would be used by experienced personnel, the RLEA would not be apprehensive over this proposed rule.

On the other hand, some locomotive engineers insist that the tests are not made often enough and that if any change is made they should be made more frequently. They point out that the rule now requires a two-part test, (1) testing to see that the cab signal devices are working properly and, (2) testing to see if the whistle works properly. They further urge that a test before departure is very important as the defects may be corrected before the train moves out. The representatives of the engineers insist that train stop and train control apparatus are delicate and that the vibrations to which they are exposed require tests more frequently than now required rather than less frequently.

Discussion and Findings - Rule 136.587. The first issue in this rule is whether a departure test either on departure from initial terminal or prior to entering equipped territory if cut out between initial terminal and equipped territory, instead of at both places if cut out, would retain adequate protection and safety. As seen, the changes that have taken place since the railroads of the nation have given up the steam locomotive are so great as to remove the need for the double testing once required. This is a return to the 1939 requirements, but experience has indicated the either/or requirement to be sufficient. Moreover, rule 136.567 gives additional protection for good measure. Regarding the once-every-24 hours issue, the same comments apply to that issue as to the either/or requirement.

The only real apprehension on this record about the use of portable test equipment is in respect to whether the portable equipment is properly constructed, maintained and used only by properly trained personnel. As seen, there is no sound reason to doubt managerial judgement in the construction and use of this equipment. Experience with it today has been entirely satisfactory, and the Examiner is persuaded that it is worth a trial for the future.

All things considered the Examiner finds that this rule should be revised as proposed.

Rule 587

Departure test.--A test of the automatic train-stop, train-control, or cab-signal apparatus on each locomotive, except locomotives and multiple-unit cars equipped with mechanical trip stop only, shall be made over track elements or test circuits or with portable test equipment, either on departure of locomotive from its initial terminal or, if locomotive apparatus is cut out between initial terminal and equipped territory, immediately prior to entering equipped territory, to determine if such apparatus is in service and is functioning properly. If a locomotive makes more than one trip in any 24-hour period only one departure test shall be required in such 24-hour period. If departure test is made by an employee other than engineman, the engineman shall be informed of the results of such test and a record kept thereof.

Since the advent of the diesel power, some engines may run as much as 2,000 miles after leaving their initial terminal before entering territory equipped with automatic train stop or train control systems. It is neither practical nor economical to leave the equipment cut in for such distances after having made the departure test upon leaving the initial terminal. In such circumstances, the equipment is cut out and must, under the present rule, be tested again before entering equipped territory. The proposed rule would permit a departure test to be made either on departure of locomotive from its initial terminal or if locomotive apparatus is cut out between initial terminal and equipped territory, prior to entering such territory. The main thrust of RLEA's objection to this portion of the rule is the assertion that more not less tests should be required. However, under rule 567 which is not here in issue, train movements may be made even though an automatic train stop, train control, or cab signal device fails, provided certain restrictions are observed. We therefore believe that ample protection will be afforded whether the test is made at the initial terminal or immediately before entering equipped territory.

The proposed rule also provides that if a locomotive makes more than one trip in any 24-hour period, only one departure test shall be required in such 24-hour period. This provision eliminates the necessity of making several departure tests a day on equipment such as locomotives and self-propelled passenger cars used in suburban or turn-around service which make several round trips daily between the same points. In view of the additional protection afforded by rule 567, we conclude that one test during a 24-hour period as proposed is sufficient.

The proposed rule also permits use of portable test equipment for making departure tests, which is not permitted under the present rule. The Bureau has received numerous requests for individual relief from the requirements of this rule so that portable test equipment may be used instead of permanent testing equipment. The record indicates that portable test equipment has been found to be as reliable and efficient as permanent installations and we find that the use of portable equipment should be authorized as proposed.

We conclude that the proposed rule should be adopted.

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Section 236.587 Departure test.

The purpose of the departure test is to assure the ATS, ATC or ACS apparatus is in service and is functioning properly. This section provides the test may be made over track elements or test circuits permanently installed in the track or with portable test equipment. Recent technological developments permit the test device to be mounted onboard the locomotive. Therefore, the FRA proposes that this section be revised to include onboard test devices as a permissible means of testing such equipment. No other changes are proposed.

Section 236.587 - Departure test.

FRA proposed to revise this section to permit the use of onboard test devices as a permissible means to perform departure tests. This and previous changes have made this section difficult to understand. Therefore, the section has been editorially restructured for clarity.

CLASSIFICATION OF DEFECTS

- 587.01 Test of automatic train stop, train control, or cab signal apparatus on locomotive not made on departure of locomotive from its initial terminal if equipment on locomotive is not cut out between its initial terminal and equipped territory. (Does not apply to locomotives and multiple-unit cars equipped with mechanical trip stop, or locomotives making more than one trip in each twenty-four hours where a departure test has been made on the locomotive equipment within the corresponding twenty-four hour period.)
- 587.02 Test of automatic train stop, train control, or cab signal apparatus on locomotive not made immediately prior to entering equipped territory, if equipment on locomotive is cut out between its initial terminal and equipped territory.
- 587.03 Automatic train stop, train control, or cab signal apparatus on locomotive making more than one trip within a twenty-four hour period not given a departure test within the corresponding twenty-four hour period.
- 587.04 Record of departure test of automatic train stop, train control, or cab signal equipment not posted in cab of locomotive.
- 587.05 Record of departure test of automatic train stop, train control, or cab signal equipment on locomotive not kept at test location. (Does not apply where impractical and, in lieu thereof, certification and results of test are transmitted to the dispatcher or a designated individual.)
- 236.588 Periodic test.
This rule requires that except as provided in Rule 236.586, periodic tests of the automatic train stop, train control, or cab signal apparatus shall be made at least once every 92 days, and on multiple-unit cars as specified by the carrier subject to approval by FRA.
- Application:
Applies to automatic cab signal, train stop, and train control systems.
- 587.06 Record of departure test of automatic train stop, train control, or cab signal equipment on locomotive not signed by employee making test.

587.07 Record of departure test of automatic train stop, train control, or cab signal equipment on locomotive not transmitted to dispatcher or designated individual. (Does not apply where it is practical to leave copy of record at test location.)

In keeping with Rule 236.586, the prescribed 92 day requirement of this rule is not applicable where periodic tests are made on locomotives at intervals of not more than two months. No other deviation from these requirements is permissible without approval of FRA.

The daily or after trip test prescribed by Rule 236.586 and the departure test prescribed by Rule 236.587 are functional tests that determine the apparatus is properly adjusted and performing as intended for day-to-day operation. The purpose of the periodic test is to provide a more thorough and in-depth test and inspection of the electrical and pneumatic equipment.

All defective conditions shall be immediately corrected during the periodic test which shall consist of at least the following tests and inspections:

1. Thorough examination of the electrical portion including measurement of the insulation resistance.
2. Measurement of the power supply voltage.
3. Measurement of the pickup value required to restore the device to normal condition.
4. Measurement of the release value of the device in continuous noncoded systems.
5. Test of sensitivity of intermittent inductive automatic train stop system.
6. Measurement of acknowledging time.
7. Measurement of delay time.
8. Measurement of reset time in train stop and train control systems.
9. Measurement of height of receiver of intermittent inductive automatic train stop and continuous inductive systems having onboard test equipment, and of tripper of mechanical trip stop system.

10. Test of audible indicator.
11. Replacement of relays with dates that expire prior to next scheduled periodic test.
12. Replacement of pneumatic apparatus with cleaning dates that expire prior to next scheduled periodic test.
13. Measurement of accuracy of governor in train control systems.
14. Cycle test of apparatus to determine that it functions as intended.

Rule 236.110 requires that the results of periodic tests be recorded on a form provided for that purpose.

Section 236.588 Periodic test.

The current provisions of this section require ATS, ATC and ACS apparatus to be tested at least once every three months, except as provided in section 236.586, and multiple unit cars as specified by the carrier subject to approval of the FRA. During the informal meetings, the AAR pointed out that tests of locomotives required in 49 CFR 229 are prescribed at 92 day intervals.

Accordingly, the FRA proposes to revise this section to require periodic testing of apparatus on equipped locomotives at 92 day intervals. This minor revision will coincide with the FRA's locomotive rules and regulations and permit more efficient utilization of locomotives by the industry. In view of the proposed revision of section 236.586, the FRA intends that the periodic test prescribed by this section be a thorough and indepth test of ATS, ATC and ACS apparatus. The periodic test shall be made in a manner that determines the apparatus is installed and maintained to meet the rules, standards and instructions contained in Subpart E of this Part. Each defective condition shall be immediately corrected during the periodic test which shall consist of at least the following tests and inspections:

1. Examination of the electrical cables and wires including measurement of insulation resistance;
2. Measurement of the power supply voltage;
3. Measurement of the pickup value required to restore the device to normal condition;
4. Measurement of the release value of the device in continuous non coded systems;
5. Test of sensitivity in intermittent inductive ATS systems;
6. Measurement of acknowledging time;
7. Measurement of delay time;
8. Measurement of reset time in train stop and train control systems;
9. Measurement of height of ATS or ATC receivers, except in continuous inductive coded systems, and tripper mechanism of mechanical trip stop system;
10. Test of audible indicator;
11. Replacement of relays with dates that expire prior to next scheduled periodic test;
12. Replacement of pneumatic apparatus with cleaning dates that expire prior to next scheduled periodic test;
13. Measurement of accuracy of speed governor in train control system; and
14. Cycle test of apparatus to determine that it functions as intended.

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The FRA again emphasizes the proposed changes in section 236.586 would require very thorough periodic tests which will assure proper operation between tests. The FRA wishes to clarify that this Part contains no provisions for out-of-service time credits. Therefore, the apparatus and its components are required to be tested, cleaned or replaced as required without regard to the days the locomotives may be out-of-service under the provisions of 49 CFR 229.

CLASSIFICATION OF DEFECTS

- 588.01 Periodic tests of automatic train stop, train control, or cab signal apparatus not made at least once every 92 days.
- 588.02 Periodic tests of automatic train stop, train control, or cab signal apparatus not made at least once every two months where daily or after trip test is not performed.
- 588.03 Periodic tests of automatic train stop, train control, or cab signal apparatus on multiple-unit car not made at periods specified by carrier.

236.589 Relays.

This rule requires that each relay, except master or primary relay of torque type, be removed from service and shopped at least once every six years. Master or primary relay of torque type depending on spring tension to return contacts to deenergized position shall be removed from service and shopped at least once every two years.

Application:

Applies to automatic cab signal, train stop, and train control systems.

The rule requires that each relay be removed from service as prescribed, subjected to thorough test, and necessary repairs and adjustment made.

The rule prohibits the relay from being returned to service unless its operating characteristics are in accordance with the limits within which such relay is designed to operate. In order to preclude loss of shelf time, a date tag may be applied showing when the relay was placed in service. In the absence of a date tag, or where the date is altered or illegible, the shop date of the relay will be used to determine when the relay should be removed from service.

Section 236.589 Relays.

The requirements of the current rule have remained unchanged since the original rules were adopted in 1939.

The rule requires that every 4 years all relays shall be removed from the onboard ACS, ATS, or ATC equipment and sent to a shop, where the relays will be thoroughly tested and repaired. The relays shall not be placed back in service unless the relay meets the specifications for the operating characteristics applicable to that relay.

These test requirements for onboard relays are different from the testing requirements for wayside signal relays which must be tested every 2 years, but are not required to be removed and sent to a shop for inspection, testing and repair.

The FRA considered several different proposals to reduce the burden of this rule. The experience of the carriers has shown that very few relays are found to be defective by this 4 year cycle of removal from service for testing and repair.

However, certain types of onboard relays have caused a significant number of false proceed signal failures in systems that use continuous non-coded ACS, ATS or ATC track current. The FRA proposes to extend the 4 year removal and test period to 6 years for most relays, but to require more frequent testing for those types of relays which have a history of causing false proceed signal failures. The overall effect will be to reduce the testing burden on the industry but will maintain or increase the safety results of this type of testing. The interested parties to this proceeding agree with the proposed changes.

CLASSIFICATION OF DEFECTS

- 589.01 Relay, other than a master or primary relay of torque type, not removed from service for test and necessary repairs and adjustment at least once every six years.
- 589.02 Master or primary relay of torque type depending on spring tension to return contacts to deenergized position of noncoded system not removed from service for test and necessary repairs and adjustment at least once every two years.
- 589.03 Relay replaced in service after test and repair with operating characteristics not in accordance with the limits within which such relay is designed to operate.
- 236.590 Pneumatic apparatus.

This rule requires that automatic train stop, train control, or cab signal pneumatic apparatus be inspected and cleaned at least once every 736 days and the cleaning date shown on such apparatus.

Application:

Applies to automatic cab signal, train stop, and train control systems.

This rule requires that pneumatic apparatus of the automatic cab signal, train stop, or train control device be inspected and cleaned at least once every 736 days.

The apparatus must be stenciled, tagged, or otherwise marked to indicate the last cleaning date of the apparatus. It is the carrier's prerogative which method is used.

Section 236.590 Pneumatic apparatus.

One party has proposed, and the other parties have agreed, to change the current 24 month test period to 736 days which will be uniform with other FRA air brake testing rules. This will permit all pneumatic apparatus on locomotives to be tested together.

The FRA has had some difficulty in determining when this type of apparatus was last inspected or cleaned. Such information is vital for the proper maintenance of the pneumatic apparatus as well for meaningful enforcement of this rule. The carrier must have a method of determining the last cleaning date if the apparatus is to be cleaned on a definite schedule as it should be.

The FRA proposes that the revised rule also address the change of testing period and the lack of information concerning the last test date. The FRA proposal will not impose any significant burden on the carriers.

CLASSIFICATION OF DEFECTS

- 590.01 Automatic train stop, train control, or cab signal pneumatic apparatus not inspected and cleaned at least once every 736 days.
- 590.02 Automatic train stop, train control, or cab signal pneumatic apparatus not stenciled, tagged, or otherwise marked to indicate last cleaning date.

Subpart F - Dragging Equipment and Slide Detectors
and Other Similar Protective Devices

STANDARDS

- 236.601 Signals controlled by devices; location.

This rule requires that signals controlled by devices to protect against unusual contingencies, such as landslides, dragging equipment, washouts, etc., shall be located so that stopping distance will be provided between the signal and the point where it is necessary to stop the train.

Application:

This rule is applicable to all signals or systems governing the movement of trains into one or more blocks that are not covered in Subparts B, C, D, and E of Part 236.

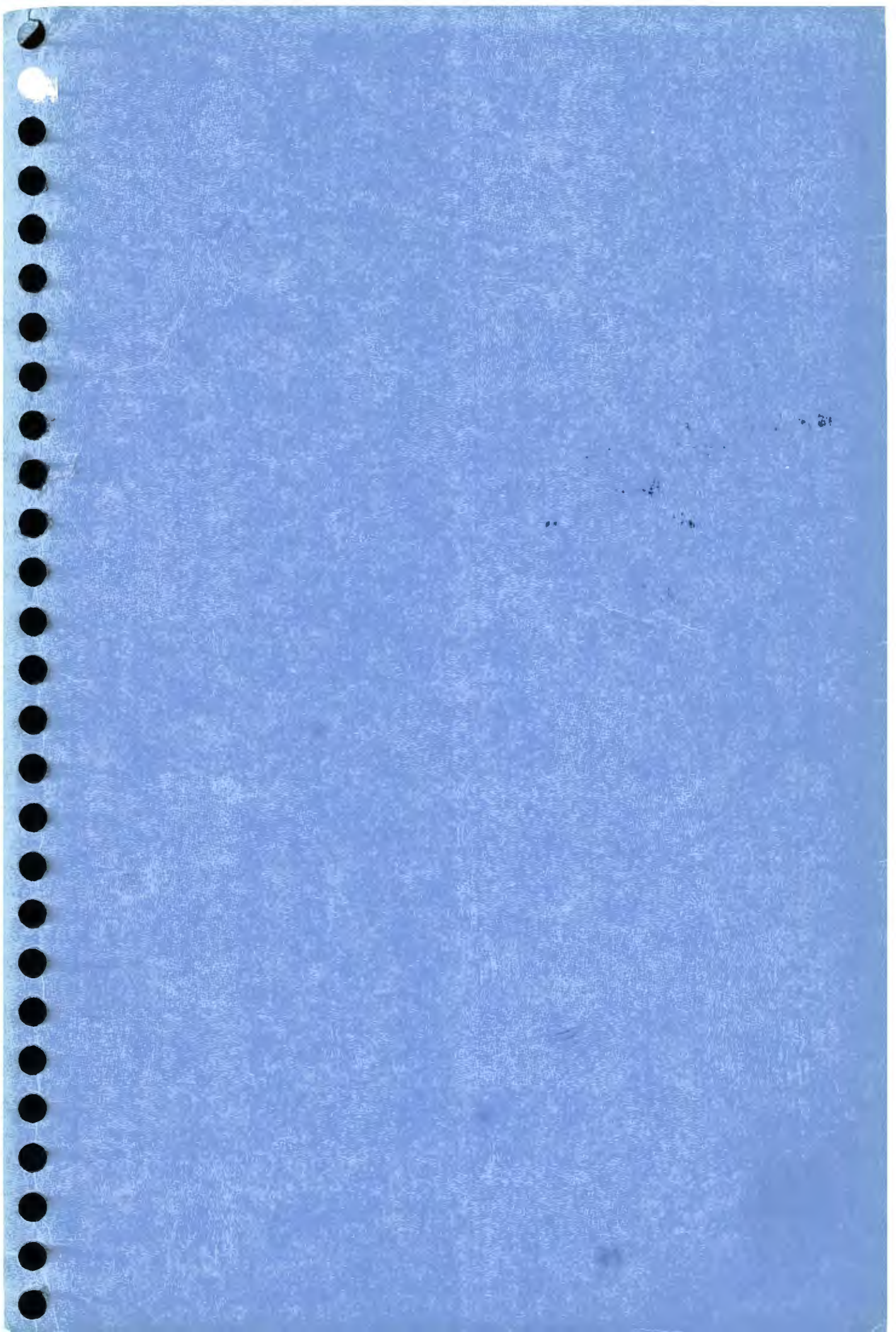
Subpart A of Part 236 shall be the section used when citing defective conditions of devices or systems covered by this rule.

Such protective devices are installed as safety features and shall not be removed without approval of FPA unless the condition that warranted their installation ceases to exist. If for some reason the signals or devices are removed from service for a temporary period the carrier shall take appropriate measures to protect safety of train operation.

CLASSIFICATION OF DEFECTS

- 601.01 Signal controlled by device used to provide protection against unusual contingencies, such as landslides,

dragging equipment, burned bridges or trestles,
and washouts not located so that stopping distance
is provided between the signal and the point where
it is necessary to stop the train.



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