[4910-06-M]

Department of Transportation

Federal Railroad Administration

[FRA Docket No. 87-2, Notice. No. 5]

RIN 2130-AB20

Automatic Train Control and Advanced Civil Speed Enforcement System; Northeast Corridor Railroads

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT).

ACTION: Proposed Order of Particular Applicability.

SUMMARY: FRA is proposing to issue an order of particular applicability requiring all trains operating on the north end of the Northeast Corridor (NEC) between Boston, Massachusetts and New York, New York, to be controlled by locomotives equipped to respond to a new advanced civil speed enforcement system (ACSES) in addition to the automatic train control (ATC) system that is currently required on the NEC. The proposed order also contains performance standards for the cab signal/ATC and ACSES systems on the NEC. The order would authorize increases in certain maximum authorized train speeds and safety requirements supporting improved rail service.

DATES: Written comments must be received by [insert 60 days after publication]. Comments received after the comment period has closed will be considered to the extent possible without

incurring additional delay. A request for a public hearing must be received by [insert 30 days after publication].

ADDRESSES: Written comments should be submitted to Ms. Renee Bridgers, Docket Clerk, Office of Chief Counsel, FRA, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

W. E. Goodman, Staff Director, Signal and Train Control Division, Office of Safety, FRA, 400 Seventh Street, S.W., Washington, D.C., 20590 (telephone (202) 632-3353), or Patricia V. Sun, Office of Chief Counsel, FRA, 400 Seventh Street, S.W., Washington, D.C. 20590 (telephone (202) 632-3183).

SUPPLEMENTARY INFORMATION

Statutory Authority

FRA has both discrete and plenary legal authority to require that all trains operating on the NEC be equipped with automatic train control devices. FRA has broad legal authority to "prescribe regulations, and issue orders for every area of railroad safety...." 49 U.S.C. 20103. Section 20502 of Title 49, United States Code specifically provides that "[w]hen the Secretary of Transportation decides after an investigation that it is necessary in the public interest, the Secretary may order a railroad carrier to install ... a signal system that complies with the requirements of the Secretary." As originally enacted and prior to formal codification, this provision referred to "automatic train stop, train control, and/or other similar appliances, methods, and systems intended to promote the safety of railroad operation ...." This authority has been previously invoked to require the installation of signal systems on 49 specific railroads and to require all railroads desiring to operate at high speeds to install signal systems of varying degrees of sophistication consonant with those higher speeds.

Background--Development of the NEC

The National Railroad Passenger Corporation (Amtrak) provides service over the NEC from Washington, D.C., to Boston, Massachusetts. Amtrak owns or dispatches most of the NEC, which it shares with several commuter authorities and freight railroads. Maximum track speeds on certain segments of the NEC south of New York City (the "South End") are limited to 125 miles per hour (mph) for Metroliner equipment. Current speeds north of New York City (the "North End") range up to 110 mph.

Amtrak is currently undertaking a major improvement project on the NEC, with particular emphasis on completion of electrification, installation of concrete ties and high-speed turnouts, elimination of some remaining highway-rail crossings, and other modifications concentrated between New Haven, Connecticut, and Boston. These improvements are designed to facilitate service utilizing high-speed trainsets (HST's) at speeds up to 150 (mph). Similar service would also be implemented on the south end of the NEC, with the initial increase in maximum speed expected to be from 125 mph to 135 mph. During 1999, Amtrak will begin taking delivery of HST's expected to qualify for operation through curves at higher levels of unbalance (and thus higher speeds) than conventional trains.

Increases in operating speeds would be accomplished during a period of continued traffic growth. Commuter and intercity trains are expected to increase in number over the next 20 years. Local freight traffic is expected to increase on the North End, and recent proposals for the sale of Consolidated Rail Corporation have given rise to the possibility that freight operations on the South End, particularly in Maryland, might increase.

In its planning for implementation of high-speed service between New Haven and Boston, FRA recognized that a more secure train control system would be required to address

the increased potential for collisions associated with increased traffic density. As planning for South End service growth matures, similar conclusions are likely. Although this proposed order does not address territory owned and dispatched by the MTA Metro-North Railroad between New Rochelle, New York, and New Haven similar concerns may arise in that territory as intercity service increases.

FRA is concerned that planning for high-speed service not occur in isolation from measures that can reasonably address increased traffic densities. Future increases in traffic is one factor that will drive future innovative technology.

Proposed Signal and Train Control Enhancements

Providing signalization for high-speed intercity service will require implementation of an enhanced cab signal/speed control system. The new system must allow for higher train speeds while providing sufficient gradations of intermediate speeds to allow efficient movement of other scheduled trains operating in the conventional speed range. Reasonable interoperability of existing and new on-board equipment is also desirable to provide for the continued use of existing on-board equipment which will be used only at conventional speeds.

Amtrak presently uses a four-aspect continuous cab signal/speed control system. Amtrak proposes to replace this system with a new nine-aspect continuous cab signal/speed control, referred to in this order as "cab signal/ATC," and an intermittent transponder civil speed enforcement system providing for train operations of up to 150 mph; intermediate speeds of 125, 100, 80, 60, 45, and 30 mph; and a positive stop feature. Amtrak calls the new transponder-based portion of this system, which would provide positive stop and civil speed enforcement capability, the "Advanced Civil Speed Enforcement System" (ACSES).

9-Aspect Cab Signal System. The cab signal/ATC portion of the new system will employ two carrier frequencies, 100 Hz, compatible with existing equipment, and 250 Hz. Both frequencies will be coded at standard rates of 75, 120, 180, and 270 cycles per minute. Upgraded equipment will be able to take advantage of the 150 mph code rate for maximum authorized speed, the 80 mph code rate for high speed diverging moves, and separate 45/40 and 30 mph speed commands for limited and medium speed turnouts.

Although existing four-aspect equipment will not be able to take advantage of these additional features, it can continue to operate as it does today. Instead of diverging through a high speed turnout at 80 mph, this equipment will diverge at 45 mph (passenger trains) or 40 mph (freight). In addition to the conventional diesel-electric and straight electric trains currently traveling on the NEC, FRA anticipates that new HST's will be used to minimize the run time between Boston, New York, and Washington. The first stage of the installation of the 9-aspect system involves conventional electronic coded track circuits. The next stage involves the conversion of these electronic track circuits for use in electrified territory. No civil speed restrictions will be reflected in this cab signal/ATC system. There will be no positive stop aspect or indication associated with the cab signal/ATC system other than a stop signal displayed at home signal locations. The cab signal/ATC system provides control based on track and route conditions ahead. It will operate as a stand alone system with an interface to the brake valve to enforce speed control.

ACSES. In contrast to the modified cab signal system, the ACSES will provide new safety functions that--with limited exceptions--are not currently provided. For purposes of civil speed control, permanent wayside transponders would be placed in sets (normally two to a set) at convenient, accessible locations in the center of the track approaching speed restriction zones.

The transponders would be passive devices requiring no energy source other than that transmitted from a passing train. Each permanent transponder set would contain encoded information about speed restrictions ahead, including: (i) the distance to the beginning of the speed restriction; (ii) the target speed; (iii) the type of speed restriction; (iv) the average grade between the location where the speed reduction must begin and the location where the reduced speed must be reached; (v) the distance to the next permanent transponder set location; and (vi) necessary sync and check bytes to allow for message verification. Since the number of discrete codes available is large, it would be possible to provide speed and distance information for more than one speed restriction at a time.

The two transponders in a set are used to determine which message the train should accept, determined by the direction of the train as follows: the train would receive the appropriate message from the order in which the transponders in the set are read, e.g., if "A" is encountered first, the message for movement in the direction from "A" to "B" would be received; if "B" is encountered first, the message for the opposite direction, from "B" to "A," will be received.

At distant signals prior to interlocking home signals and control points in high-speed territory, dynamic transponders would be provided. These transponders would communicate the status of the home signal providing for positive stop enforcement.

Each locomotive, power car, and non-powered control car would be equipped with a transmitter/receiver, an antenna mounted under the vehicle, an axle generator (to measure speed and distance traveled), an on-board computer, and an aspect display unit. The vehicle would continuously transmit a signal which, when received by a wayside transponder, would cause the transponder to transmit back its encoded message. The on-board equipment would then decode

this message and the on-board computer would calculate the braking distance based on the present speed of the train, the information received from the transponder set, and the standard Amtrak reduction braking curves with a 12.5% safety factor compensated for grade together with an 8-second reaction time. When the train reaches the calculated distance from the speed restriction, an audible alarm would sound and the new speed would be digitally displayed in the cab of the vehicle. The engineer must acknowledge the alarm. If the train is above the speed required by the profile generator inside the on-board computer, the engineer would be required to bring the train down to the required speed. Failure to do so would result in an automatic penalty application of the brakes which can only be released when the train is below the required speed.

The on-board computer would be programmed to calculate speed and braking distance based on the type of equipment it is mounted on. A high performance train, such as a tilt body train, would be allowed to run at a higher speed around a curve than conventional passenger equipment if consistent with allowed unbalance. A safe default speed would be provided in the railroad operating rules in the case of tilt body equipment failure or ACSES failure.

Temporary speed restrictions would be entered into the civil speed enforcement on-board computer at the beginning of the run. Normally the speed restrictions would be entered by a data radio located at strategic entrances and locations along the NEC. In the event that the data radio is inoperative, the engineer would be able to enter the information from the paper Form D he or she receives that lists all temporary speed restrictions.

In the fully deployed system, data radio transmitters would be provided at all interlockings in equipped territory, permitting updating of temporary restrictions and verification that on-board information is complete. Crews would continue to receive paper

Form D's, and temporary speed boards would be provided. An alternative approach to enforcement of temporary restrictions has also been posited by Amtrak. Under this approach, portable speed restriction transponder sets would be utilized to enforce temporary speed restrictions. Temporary transponder sets would be placed at braking distance for the worst case trains. All trains operating at maximum authorized speed that encounter a temporary transponder set would immediately begin to reduce to the speed called for on the transponder so distance to go, ruling grade, or distance to the next transponder information will not be necessary. When a temporary transponder set is encountered, it would not reset the "next transponder location window" information in the on-board computer, and the on-board equipment would continue to look for the next permanent transponder set. All permanent transponder sets are "linked" in that each set identifies the location of the next set in the chain, but temporary transponders are not part of this linkage.

For the immediate future, only some Amtrak power units will respond to all of the new frequencies of the cab signal/ATC system. Those units would receive a maximum 125 mph speed indication where the signal system permits. Recently, Amtrak has indicated that some changes to on-board equipment would be required for other users where Amtrak introduces the high-speed cab signal/ATC array (in particular, use of the 270 pulses per minute at both 100 and 250 Hz as a new 100 mph code and use of 270 pulses per minute at 100 Hz as a code allowing movement over #26.5 turnouts at 60 mph). Although the changes in the cab signal code rates and carrier frequencies form an important backdrop for this proceeding, no approval for these changes is required or implied in this proposed order. At the same time, FRA is conscious that existing requirements for cab signal/ATC are implicated in Amtrak's migration strategy; accordingly, FRA holds open the possibility of resolving any necessary issues in the final order

should it become apparent that they are so interrelated as to defy separate resolution. Further, to the extent the proposed changes in code rates and associated arrangements may otherwise be considered material modifications subject to approval under 49 CFR Part 235, FRA proposes to resolve any related issues in this proceeding. (See 49 CFR §235.7(c)(1).)

Improvements that Amtrak would gain with the new systems are:

- train speeds of up to 150 mph;
- a high speed diverging aspect (80 mph);
- the efficient handling of both high speed and conventional trains;
- new intermediate speeds between 45 mph and 150 mph;
- the capability for headway improvement in congested commuter areas; and
- practical staging from present wayside and on-board equipment

Commuter and freight railroads would obviously benefit from enhanced safety of Amtrak operations, given the common operating environment. Amtrak's implementation of the 9-aspect cab signal system would provide increased flexibility to schedule high speed intercity service in a way that does not conflict with commuter operations. In addition, as the ACSES is implemented on commuter and freight trains, the safety of those operations would be enhanced, ensuring that those trains do not pass absolute stop signals or operate at excessive speed approaching stations or bridges. To the extent equipment design permits, commuter operators would also be able to take advantage of higher speeds on curves without diminished safety margins if flexibility for operation at higher cant deficiencies contained in FRA's proposed revisions to its Track Safety Standards in 49 CFR Part 213 (62 FR 31638; July 3, 1997) is adopted in the final rule.

Implementation

In order to obtain the maximum benefit from the positive stop and civil speed enforcement system prior to its installation on the entire NEC, Amtrak has developed a strategy to phase-in installation. The initial installations would protect entry to and operations along the high speed territory. During the initial phase, the transponders would not be installed on non-high speed tracks where flanking protection protects against possible encroachment into the adjacent high speed tracks. After all installations are in place on high speed tracks and on adjacent tracks where flanking protection does not exist, the transponder system would be extended to the balance of the NEC. This phased-in installation would also allow users of the NEC to defer installation of the ACSES system on some of their rolling stock while they obtain the necessary internal or external financing.

A specific application of this interim installation staging strategy being considered between New York and Washington, D.C. is to operate the new HST's up to 135 mph in specific areas where Metroliners currently operate at 125 mph and where signal spacing, catenary and track structure are adequate for 135 mph operation of HST's. For example, 135 mph operation is possible on Tracks 2 and 3 between "County" Interlocking (MP 32.8, west of New Brunswick, New Jersey) and MP 54.0 east of "Ham" Interlocking east of Trenton, New Jersey. Consideration is being given to initially installing the "ACSES" transponder based civil speed and positive stop enforcement system only on Tracks 2 and 3 between "County" (MP 32.8) and "Ham" (MP 55.7), depending on flanking protection at "Midway" (MP 41.3) to divert any possible stop signal "overruns" away from the path of an HST operating over 125 mph on Track 2 or 3.

In addition to the use of flanking and phased installation, freight trains that are not equipped with ACSES will be allowed to operate on the NEC at off-peak times when no high speed passenger trains are operating in the area. These operations would be within windows that have been verified and strictly adhered to. This exception would be created to allow the smaller entities to continue to operate prior to the equipping of all their equipment.

This strategy would allow Amtrak to take advantage of some of the new HST's capability before the ACSES system is fully installed and before all other vehicles can be equipped. These initial installations would also give operating personnel some solid experience with the new system before it is extended throughout the entire NEC.

Other areas being considered for 135 mph operation with initial ACSES installation in this same manner are "Morris" (MP 58.4) to MP 74.0 east of "Holmes" (MP 77.2), "Ragan" (MP 29.9) to "Bacon" (MP 51.0) with No. 3 track only extended on through "Bacon" to MP 56.7 north of "Prince" (MP 57.3), and "Grove" (MP 112.6) to "Landover" (MP 128.8). Taken together as an initial installation in the New York to Washington portion of the NEC, 171 track miles of ACSES could provide up to 80 route miles of 135 mph operation on the 225 mile run. This strategy would provide initial valuable operating benefits and experience without sacrificing any of the higher level of safety required for trains operating over 125 mph, and without (initially) equipping any vehicles other than those trains operating over 125 mph.

Between New York City and Washington, D.C., Amtrak proposes for the present to install the ACSES system only in territory where train speeds will exceed 125 mph. Since freight trains do not operate on the NEC at speeds over 50 mph, and none of the existing commuter equipment operating on the NEC can operate at speeds exceeding 125 mph, Amtrak does not view installation of ACSES on freight and commuter equipment operating between

New York City and Washington, D.C. to be necessary during the initial phase. The installation of ACSES between New York and Washington, D.C. would provide transponder-based positive stop enforcement on all main tracks where speeds exceed 125 mph, and on all tracks leading to high-speed tracks where flanking protection is not provided.

Between New Haven and Boston, the ACSES would be installed on all main tracks where speeds exceed 110 mph. Ultimately, plans call for installation of this system on all main tracks along the NEC where speeds currently exceed the 60-80 mph range except for New Rochelle to New Haven, a segment controlled by the MTA Metro-North Railroad where speeds will not exceed 110 mph.

Another interim installation concerns the use of #26.5 straight-frog turnouts. These turnouts are only good for diverging moves at 60 mph. Amtrak intends to install these turnouts at limited locations where there is insufficient space to install the #32.7 turnouts needed for diverging moves at 80 mph. Using the 60 mph aspect in the 9-aspect cab signal/ATC system requires all equipment to be able to receive and decode 270 code.

To allow for the installation of these 60 mph turnouts in territory where all users have not yet upgraded to the full 9-aspect system, Amtrak proposes an interim procedure. Until all users have been equipped, Amtrak proposes that the cab signal/ATC system will display an 80 mph aspect for diverging moves over these turnouts. The ACSES passive transponder sets approaching this location and at this location would enforce a 60 mph civil speed restriction for all routes through the interlocking where the #26.5 turnout is located. An active transponder would be located at the distant signal prior to the locations where trains must begin to reduce to 60 mph. This active transponder would override the 60 mph civil speed command when the

signal system logic determines that the interlocking is cleared for a non-diverging move at a higher speed than 60 mph.

This scheme requires that all vehicles equipped with the 9-aspect cab signal/ATC system also be equipped with ACSES. Existing 4-aspect cab signal/ATC systems would enforce 45 mph for passenger trains and 30 mph for freight trains. This interim arrangement would also be backed up by a site specific instruction and an appropriate reflectorized sign on the distant signal requiring 60 mph with the display of the "Cab Speed" aspect. When all vehicles operating in the area are equipped, the active transponder can be removed and the 270 code for 60 mph installed.

Under Amtrak's design, the ACSES system would be required to have a minimal database for the entire NEC which would enable a train to always know where it is within the NEC, which track it is on, what permanent speed restrictions apply, and where the next temporary speed order would need to be executed. With this capability, the ACSES system would be able to perform certain auxiliary functions required by HST's.

Regulatory Approvals Required

In general, new signal and train control systems must comply with FRA's Rules, Standards and Instructions Governing the Installation, Inspection, Maintenance, and Repair of Signal and Train Control Systems, Devices, and Appliances (49 CFR Part 236). FRA will implement any exceptions on a case-by-case basis through the waiver process as provided by 49 CFR Part 235. Train operations in excess of 110 miles per hour must be authorized by FRA after examination of pertinent safety considerations in accordance with 49 CFR § 213.9(c). Metroliner service on the NEC is conducted in accordance with such an authorization.

In addition, NEC operations are subject to special requirements of the Rail Safety Improvement Act of 1988, which mandated that all NEC trains be equipped with "automatic train control systems designed to slow or stop a train in response to external signals." Sec. 9, Pub. L. No. 100-342, implemented at 52 FR 44510 (Nov. 19, 1987), 53 FR 1433 (Jan. 19, 1988), and 53 FR 39834 (Oct. 12, 1988).

Safety Performance Standards

On May 29, 1992, Amtrak informed FRA of its intention to implement a proposed 9-aspect cab signal\speed control system supplemented with an intermittent transponder civil speed enforcement system on the NEC. On June 23, 1992, FRA notified Amtrak that the proposed system would have to comply with Part 236. FRA also suggested the following specific performance standards for the ACSES components:

1. The system must enforce permanent and temporary civil speed restrictions (e.g., track curvature, bridges, and slow orders).
2. All trains operating over the trackage of the proposed system must be equipped to respond to the continuous cab signal/speed control system and intermittent transponder civil speed enforcement system.
3. Conflicting aspects or indications may not be displayed in the locomotive cab.
4. The system must enforce the most restrictive speed at any location associated with either the civil restriction or cab signal aspect.
5. The system shall include a restricted speed command or code rate to permit the train to continue at restricted speed only if this command is received. The system shall be arranged so that if the speed command is

> not received the train will be brought to a stop and cannot be moved again until some type of apparatus interconnected with the train control system and controlled by the dispatcher is used. The train may then only travel at restricted speed until a valid speed command is received by the on-board train equipment.

In a September 17, 1992 letter, Amtrak responded to technical issues raised at an earlier meeting between Amtrak and FRA. Amtrak agreed with performance standards 1, 3, and 4, but had reservations concerning performance standard 2 because of the funding needed to upgrade commuter and freight corridor users' train control systems. Amtrak also questioned the need to equip certain user vehicles with a full microprocessor scanning system if the user trains did not operate at speeds in excess of 100 mph, civil speed reductions in the territory operated were relatively few, and civil speeds could be controlled by the continuous cab signal enforcement system without adversely impacting train schedules or on-time performance.

Amtrak also requested relief from performance standard 5, which requires an enforced stop at interlocking signals with an advance track configuration that would not establish high speed track fouling, where the maximum authorized speed does not exceed 45 mph through an interlocking arrangement or terminal. The system would still contain a recurring 15 second audible warning and a 20 second acknowledge requirement while operating at restricted speed.

At a meeting on September 20, 1994, the Northeast Corridor Safety Committee, a federal advisory committee chartered pursuant to the Rail Safety Enforcement and Review Act of 1992, considered the issue of an enhanced NEC train control system and agreed with draft performance specifications similar to those set forth above. The draft performance standards placed before the Committee included equipping of all movements in high-speed territory.

However, the issue of increased speeds south of New York City was not discussed, since Amtrak had not proposed to increase speeds on the South End at that time. The Committee was in general agreement that the current cab signal/ATC system should be supplemented, as proposed by Amtrak, in connection with NEC improvements.

Discussion

Safety need. Increases in train speed, in the traffic density planned for both intercity and commuter service, and in the potential for increased freight operations over a portion of the NEC territory would increase the risk of a severe accident on the NEC unless compensating measures are taken. These risks fall into four general categories requiring separate analysis, three of which are pertinent here.

The first risk is of a train-to-train collision. Although the existing cab signal/ATC system on the NEC provides a very high level of safety, some risks remain. The cab signal/ATC system currently in use on the NEC does not enforce a positive stop at signals displaying a stop aspect, nor does it require acknowledgment of the restricting aspect every 20 seconds. Instead, the engineer receives one warning that must be acknowledged when a "zero" code rate is experienced. Thus, the principal hazard is not that a train operating under a restricted speed code could strike another train. Rather, it is that a slower train could move through the control point into the path of a high-speed train. This could happen if the engineer of the train subject to the stop signal experienced an incident of micro sleep, accompanied by a conditioned response of acknowledging the warning, was distracted, or was impaired. Less likely to occur, but still possible, is a scenario where an engineer or a third party acts recklessly. This scenario must be taken seriously in light of recent acts of domestic terrorism.

Clearly, equipping only high-speed trains with on-board equipment responsive to the ACSES system is insufficient by itself to prevent collisions at key control points. Only by equipping all trains can the safe movement of high-speed trains be reasonably ensured. Amtrak's observation that positive stop capability need only be provided at locations providing access to high-speed track appears to have merit, however.

The second risk is of an overspeed derailment which may result in direct harm or harm flowing from a resulting impact with other trains or fixed objects. Currently, locations on the NEC where signal speed restrictions are higher than the overturning speed of the curve are protected by special speed control features specific to those locations. As speeds rise for both intercity and commuter trains, the number of track segments requiring special control will increase. Allowances for higher levels of unbalance (implicit in the flexibilities proposed in the July 3 Track Safety Standards Notice of Proposed Rulemaking (NPRM)) would also create potential exposure that does not currently exist. The speed control features of the ACSES will deal effectively and economically with this potential safety exposure, while providing all passenger operators on the corridor with the potential for reduced trip times.

The third risk is of an impact with track forces or their equipment. This risk is endemic to all rail operations, but increased speed drives up potential severity and reduces the warning time of a train's approach. Unlike revenue rolling stock, many pieces of maintenance-of-way equipment will not reliably shunt or activate a signal system. Further, although great care is taken to ensure that workers and their equipment are protected from train movements, human error in issuing or executing such authorities can occur.

Although the recently published final rule for Roadway Worker Safety will help to control this risk (61 FR 65959; December 16, 1996), a train control system with the capability

to provide automatic warning to the train of the presence of workers or equipment prior to visual sighting could significantly drive down the risk of harm to both roadway workers and train occupants. This is of particular concern on a high-speed railroad with very dense operations and close track centers, conditions that prevail on much of the NEC.

The ACSES system incorporates portable transponder technology that can provide a second layer of safety for roadway workers and their equipment. Further, temporary speed restrictions would be entered into the on-board ACSES computer, providing for automatic enforcement even if temporary transponders are misplaced or vandalized. These features should increase the safety of those conventional and high-speed trains that are equipped with on-board computers.

A fourth risk accentuated by higher speeds is increased severity of an accident resulting from an undetected incursion into the right of way or clearance envelope, including possible displacement or undermining of track structure. This fourth risk is not addressed in this proceeding since the Northeast Corridor Safety Committee will evaluate this issue in a separate "system safety" proceeding to be held at a later date. However, the data radio element of the ACSES system provides a possible communication path for hazard detection information (in addition to the cab signal system).

Technical issues. In Amtrak's proposed system, the brake and propulsion interface between the ACSES and the locomotive would be similar to that utilized in conventional cab signal/ATC systems. The interface would be separate and distinct from the interface used by the cab signal/ATC system. The failure of either the cab signal/ATC system or the ACSES would not prevent the remaining functioning system from performing its intended operation and

displaying the proper on-board aspect. Both the signal speed and the civil speed would be displayed with the lower of the two speeds to be enforced.

FRA questions the need or prudence of displaying both speeds and continues to gather information on this design. Comment is requested regarding the appropriate means of displaying system information to the locomotive engineer.

The new transponder-based system would provide for enforcement of permanent civil speed restrictions (curves, bridges, etc.) and temporary speed restrictions (slow orders) in five MPH increments, as well as enforcement of stop aspects at interlocking home signals. Once the train is stopped, current plans call for the system to require the train to remain stopped for 30 seconds at which time the engineer will operate a stop override button and allow movement of the train, with the audible alarm requiring acknowledgment every 20 seconds. FRA is aware that some locomotive engineers may find repetitive acknowledgment of this feature distracting during low-speed movements through terminal areas and requests comments regarding possible alternative arrangements.

FRA discussed with Amtrak a feature under which a controlled release would be encrypted into the on-board computer at the time of departure to ensure that movement could not be made past stop aspects at home signals without a secure means of authorization. Amtrak opposed this approach, arguing that the train should remain under the control of the engineer, who may have a more complete and current understanding of considerations pertinent to the safety of the train movement. For instance, if a structure or vehicle adjacent to the wayside was on fire, it would be necessary to move the train to avoid a hazard to the passengers and crew. Nevertheless, FRA believes operation of a train where a positive stop is required should occur only after the engineer cuts out or overrides the ACSES through a mechanism located away

from the engineer's console, the location and/or operation of which would require special knowledge available only to a person authorized to operate the override. Amtrak has endeavored to respond to this concern in designing the ACSES.

Text and Analysis of Proposed Orders

For purposes of clarity and convenience, the text of the proposed order is interspersed with explanations and analysis. The text of the proposed order is printed in italics. FRA reserves the right to revise and augment the proposed order upon final issuance and invites comments on all issues relevant to the subject matter of the order.

Proposed Effective Date

As discussed above, Amtrak anticipates beginning receipt of the new HST's in 1999. FRA proposes to make this Order effective on October 1, 1999, to enable Amtrak to rapidly utilize the new system's improvements while allowing other users of the NEC to phase-in installation.

Scope and applicability. *This order supplements existing regulations at 49 CFR Part 236 and existing orders for automatic train control on the Northeast Corridor (NEC). This order applies in territory where Amtrak has installed wayside elements of the Advanced Civil Speed Enforcement System (ACSES), permitting high-speed operations under the conditions set forth below. All railroads operating on high-speed tracks in such equipped territory, or on tracks providing access to such high-speed tracks, shall be subject to this order, including the following entities operating or contracting for the operation of rail service--*

Connecticut Department of Transportation;

Consolidated Rail Corporation;

Massachusetts Bay Transportation Authority;

National Railroad Passenger Corporation (Amtrak); and

Providence and Worcester Railroad Co.

Explanation and Analysis. Amtrak has undertaken the planning and installation of the ACSES as part of its capital program for intercity service on the NEC, consistent with legislation providing for improved rail service in the region. The proposed order would require all carriers operating in ACSES territory to equip their controlling locomotives with operative on-board equipment. This equipment would consist of a transponder scanner, an on-board computer, a display unit for the locomotive engineer, and appropriate interface with the cab signal/train control apparatus.

The exception would be trackage on the South End where access is barred to non-ACSES-equipped trainsets and where increases in the maximum speed will be from 125 mph to 135 mph. In this instance, only Amtrak trains would be required to be equipped.

FRA views the distinctions between required signal and train control features on the north and south portions of the NEC to be temporary. The proposed order would allow increases in train speeds without any reduction in safety. Over time, the ACSES system should be completed and used by all operators throughout the NEC for routes where speeds exceed 110 mph on any segment, enhancing safety throughout the NEC. In fact, New Jersey Transit Rail Operations (NJT) has indicated its intention to equip its controlling locomotives with an Advanced Speed Enforcement System (ASES), deriving safety advantages both on the NEC and on certain of its lines where the ASES system can be used as an intermittent train stop system. As Amtrak, North End operators and NJT demonstrate the benefits and reliability of the system, progress toward universal upgrading of the NEC signal and train control system will be fostered. At a later date, FRA may amend this order to require more extensive use of this new

safety technology. This will be determined by increases in traffic and types of equipment used on the NEC.

Definitions. *For purposes of this order--*

"High-speed track" means (1) a track on the main line of the Northeast Corridor (NEC) between New Haven, Connecticut, and Boston, Massachusetts ("North End") where the maximum authorized train speed for any class of train is in excess of 110 miles per hour or (2) a track on the main line of NEC between Washington, D.C., and New York City, New York ("South End"), where the authorized train speed for any class of train exceeds 125 mph.

Explanation and analysis. Operations on the North End are conducted on two main tracks, while additional main tracks are available on portions of the South End. Operations are already highly dense on the North End, and projections for the future indicate significant increases in traffic, both freight and passenger. Track curvature on the North End exceeds the average curvature on the South End, resulting in greater potential concern for compliance with civil speed restrictions. Accordingly, FRA proposes to distinguish between the two operations for purposes of determining applicability of new performance requirements.

"Signal and train control system" refers to the automatic cab signal/automatic train control system (cab signal/ATC) in effect on the NEC at the date of issuance of this order, as supplemented by "ACSES," together with such modifications as Amtrak shall make consistent with this order.

Performance standards. *The following performance standards and special requirements apply:*

1. Except as provided in paragraph 10(b), the signal and train control system shall enforce both permanent and temporary civil speed restrictions (e.g., track curvature, bridges, and slow orders) on all high-speed tracks and immediately adjacent tracks.

Explanation and analysis. The ACSES system can prevent derailments and collisions with fixed structures or on-track personnel or equipment that might result from overspeed operation. Accordingly, permanent civil speed enforcement and temporary speed enforcement are proposed.

Existing features of the cab signal/ATC system on the NEC provide intermittent civil speed enforcement at key locations where signal speeds exceed overturning speeds or where station operations require special protection. However, as speeds are increased, civil speed enforcement will become an issue at additional locations. The ACSES would permit higher operating speeds while maintaining a high level of safety.

The existing signal system would not enforce temporary speed restrictions, such as slow orders over defective track or protections for roadway workers. By using temporarily placed transponders, and by entering restrictions into the on-board computer by milepost, the ACSES could provide excellent protection for train movements and workers and equipment on or adjacent to live tracks. All trains equipped with on-board ACSES units would benefit from this feature.

The proposed order suggests that this requirement should be extended to tracks adjacent to high-speed tracks. The effective operating envelope for high-speed tracks includes immediately adjacent tracks. Derailments on those tracks could endanger high-speed operations.

2. Except as provided in paragraph 10(b), all trains operating on high-speed track, immediately adjacent track, or track providing access to high-speed track shall be

equipped to respond to the continuous cab signal/speed control system and intermittent transponder civil speed enforcement/ positive stop system. Freight trains that are not equipped with ACSES will be allowed to operate on the NEC at off-peak times when no high speed passenger trains are operating in the area.

Explanation and analysis. As noted above, the ACSES system could provide potential benefits for all users of the NEC. However, this proposed order would only require equipping trains on the North End, where trains are operated on high-speed tracks, or on immediately adjacent tracks providing access to high-speed tracks.

The benefits of equipping high-speed trains are obvious. The benefits of equipping conventional speed trains that operate on high-speed tracks include enforcement of civil speed restrictions, temporary speed restrictions, and positive stop features. The benefits of equipping conventional speed trains that operate on immediately adjacent tracks providing access to high-speed tracks may derive primarily from enforcement of positive stop features. If a train is prevented from inappropriately proceeding through a junction and onto a high-speed track, the safety of the subject train and the safety of the oncoming high-speed train are equally assured. As a practical matter, FRA believes that few trains required to be equipped under this proposal would not make use of high-speed tracks. Again, comment is specifically requested regarding whether any circumstances exist under which trains would be required to be equipped exclusively because they operate on adjacent tracks or on tracks providing access to high-speed tracks. (See, also, paragraph 10(b), below.)

3. No conflicting aspects or indications shall be displayed in the locomotive cab .

Explanation and analysis. The proposed order would require that consistent information be displayed to the locomotive engineer. Amtrak plans to implement this principle,

while providing information from both the cab signal/ATC system and the ACSES, by displaying both of the resulting maximum speeds. The controlling (most restrictive) limit would be displayed at twice the brightness of the other speed. The cab signal aspect would also be displayed.

FRA believes that Amtrak's proposed display (details of which are contained in the program description placed in the docket of this proposed order) is appropriate for a hybrid system such as this. However, it should be noted that the amount of *apparently* conflicting information provided to the locomotive engineer may be substantial. In particular, the engineer (who may operate non-equipped trains on certain days and equipped trains on other days) will have to contend with 9-aspect cab signal information that differs from the wayside signal and potentially the wayside or overhead speed boards, ACSES information, and at least two systems requiring acknowledgment of audible warnings (the alerting device and the combined cab signal/ATC/ACSES unit). Is this information excessive? Should a simpler display of the most safety critical information be provided as the default condition?

4. *The system must enforce the most restrictive speed at any location associated with either the civil/temporary restriction or cab signal aspect.*

Explanation and analysis. This requirement states the obvious requirement that the most restrictive of the limitations indicated by the cab signal/ATC or ACSES system must be enforced.

5. *At interlocking home signals and control points on high-speed tracks or protecting switches providing access to high-speed tracks, the signal and train control system shall enforce a positive stop short of the signal or fouling point when the signal displays an absolute stop. The system shall function such that the train will be brought to a*

complete stop and cannot be moved again until the first of the following events shall occur: (1) the signal displays a more permissive aspect; or (2) in the event of a system malfunction, or system penalty, at least 30 seconds shall have elapsed since the train came to a complete stop, the engineer has received verbal authority to proceed from the dispatcher, and the engineer has activated an override or reset device that is located where it cannot be activated from the engineer's accustomed position in the cab. The train may then only travel at restricted speed until a valid speed command is received by the on-board train equipment.

Explanation and analysis. Providing for normal and extraordinary movements past a signal that previously required an absolute stop using a hybrid cab signal/ATC/ACSES arrangement has proven to be one of the most challenging issues in the design of the new system. As originally conceived by Amtrak, in the normal case ACSES would enforce a positive stop by use of an active transponder near the distant signal that would read the cab signal code ("0"), recognize that the home signal is capable of displaying an absolute stop, and enforce a positive stop even if the home signal actually displayed a restricting indication (permitting movement through the location at up to 15 mph), unless a greater than zero code rate was detected upon reaching the "cut section" in which the home signal was located. This arrangement appeared to have several disadvantages. First, stops would be required where presently none are required. This could be a significant issue in freight operations, since enforcement of unnecessary stop commands could in some cases result in unacceptable in-train forces. Second, movements past a stop signal that became restricting after the stop would have to be made by overriding the positive stop. Third, these arrangements would inevitably lead to demands for release of the positive stop from the engineer's position in the cab, potentially

defeating the concept intended to be implemented by FRA when conversations with Amtrak were initiated on this subject in 1992.

To avoid distracting or fatiguing the engineer, and to ensure that the override function is not regarded as a feature to be casually employed, it appears to be more appropriate to restrict the use of the reset or override button to that of instances of system failures, on-board or wayside. Efficiency also suggests permitting the train to proceed when a train receives an indication more favorable than absolute stop (a consideration of interest particularly to those commuter authorities that would be subject to the proposed order). Accordingly, FRA proposed that the train control system function in greater harmony with the wayside signals. This could be accomplished in a number of ways.

First, it should be possible to place one or more additional transponders that derive information directly from the circuits controlling the home signal. Amtrak indicates that this approach could be complicated by the varying stopping distances of trains using the NEC, but in principle the approach seems feasible. If this approach were to be employed, these transponders should be placed to control speed approaching the signal while providing information concerning more favorable aspects as a means of releasing the absolute stop automatically. Second, it should be possible to use a steady 250 Hz to release the stop when the signal upgrades to restricting. This would require modifications to the signal system at each home signal and control point. Third, data radio could be used on the wayside to provide precise signal status (notwithstanding the zero code read by the cab signal system) when the signal is at "Stop and Proceed," or "Restricting." Any of these options would allow the movement past a restricting signal without the use of a reset or override button by the engineer.

Amtrak agreed, at a June 4, 1997 meeting, to accelerate the development of the ACSES data radio feature to reduce the need to operate the "Stop Override" button to only those instances in which some sort of system failure has occurred and the train must be moved. The data radio feature located at the interlocking and known as a Mobile Communication Package (MCP) would broadcast a message to the approaching train that is track specific, direction specific, and location specific that would automatically release the stop-override feature without the engineer having to operate the "Stop Override" button when the home signal displays "Stop and Proceed." The message would only be transmitted and only be effective when the train is between the distant signal and the home signal of the interlocking. If the signal displays "Restricting," the MCP data radio would broadcast a similar message to the approaching train that would relieve the train from actually having to stop. While the additional time frame and cost to develop the data radio encoder and to install these encoders along with the MCP radios at all interlockings in ACSES territory is not yet known, it is clear that this is the only method, among those that have been proposed, with long-range potential to truly enhance the future operation of ACSES on the Northeast Corridor. As the additional time frame to develop the data radio/encoder override release feature is not yet known, and as the schedule to begin high speed rail operations in 1999 is very tight, FRA recognizes that some relief concerning operation of the "Stop Override" button may be required, particularly should Amtrak seek approval for limited operations to 135 mph on the south end during 1998. FRA feels that a clear plan for migration with timetables should be submitted prior to the granting of increased speeds.

6. Failure modes of the system will allow for train movements at reduced speeds, as follows:

a. *Failure of Cab Signal/ATC System: In the event of failure of the cab signal/ATC system on board a train, the cab signal/ATC system will be cut out; however, the ACSES system shall remain operative and enforce the 79 mph speed limit. If intermediate wayside signals are provided, the train will continue to operate at speeds not exceeding 79 mph subject to indications of the wayside signal system. In territory without fixed automatic block signals, trains will run on special "Clear to Next Interlocking" signals. When failure occurs after a train has entered such a block, it will proceed at restricted speed to the next interlocking and may not pass the home signal, regardless of the aspect displayed, until the flashing lunar "Clear to Next Interlocking" signal is displayed. The train may then pass the signal and proceed at 79 mph. The speed limit shall be enforced by the Advanced Civil Speed Enforcement System (ACSES). At the next distant signal the train must begin braking, preparing to stop at the next home signal unless a flashing lunar signal with the letter "N" is displayed indicating that the "Clear to Next Interlocking" signal is already displayed ahead.*

Explanation and analysis. The cab signal/ATC portion of the system would be cut out under operating rules which meet § 236.567 requirements. The operation of trains when the cab signal/ATC portion of the system was failed and/or cut out would be enhanced by the ACSES still being in operation. The ACSES central processing unit (CPU) would receive a message from the cab signal/ATC CPU through a vital link that the cab signal/ATC is cut in and not failed. If the ACSES does not receive this message, a speed of 79 mph is locked in and the display is dark, other than the 79 mph displayed in the civil speed portion, which is enforced.

Temporary and permanent speed restrictions and positive stop at home signal locations would continue to be enforced by the ACSES system.

b. *ACSES failure*. *If the on-board ACSES fails en route, it must be cut out in a similar manner to the cab signal/ATC system. The engineer will be required to notify the dispatcher that the civil speed/positive stop enforcement system has been cut out. When given permission to proceed, the train must not exceed 125 mph (South End) or 110 mph (North End). All trains with a cut out ACSES system will operate at conventional train speeds.*

Explanation and analysis. After considering how to proceed when the ACSES must be cut out on a train, the proposed order specifies minimal requirements, which would require that trains fall back to existing maximum speeds in the territories. However, this approach cannot provide positive stop capability or compensate for higher curving speeds that may be allowed using tilt HST's. All trains with a cut out ACSES would operate at conventional train speeds whether they are tilt train equipment or conventional equipment. The vital link between CPUs mentioned in 6.(a) above would inform the signal CPU that the civil speed CPU was cut out or failed. FRA has inquired whether a default speed limit could be "enforced" through the signal speed enforcement system when the ACSES is failed and/or cut out, and Amtrak responded that this could be accomplished. The maximum speed to be enforced by the cab signal system if ACSES is cut out is 125 mph. This places a premium on compliance with operating rules developed specifically for this purpose (copies of which are available in the public docket). Comment is requested regarding appropriate measures, recognizing that electronic failures and damage to scanners from refuse on the track structure will result in ACSES failures.

c. *Cab signals/ATC & ACSES failure. If the cab signal/ATC system and the ACSES both fail en route, the systems shall be cut out and the train shall proceed as provided in 49 CFR § 236.567.*

Explanation and analysis. When the signal and train control system fails and/or is cut out en route, § 236.567 sets forth the procedures and restrictions that shall be followed.

> Where an automatic train stop, train control, or cab signal device fails and/or is cut out enroute, train may proceed at restricted speed or if an automatic block signal system is in operation according to signal indication but not to exceed medium speed, to the next available point of communication where report must be made to a designated officer. Where no automatic block signal system is in use train shall be permitted to proceed at restricted speed or where automatic block signal system is in operation according to signal indication but not to exceed medium speed to a point where absolute block can be established. 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.

These procedures are used with present train control systems, both on the NEC and throughout the Nation and have proven to be a reliable and safe method when the signal and train control system fails and/or is cut out

d. *Wayside signal system failure. If the wayside signal system fails, train operation will be at restricted speed to a point where absolute block can be established in advance of the train. Where absolute block is established in advance of the train, the train may proceed at speeds not to exceed 79 mph.*

Explanation and analysis. The carrier's operating rules shall effect these requirements. In the case of a wayside signal system failure the ACSES would still be functioning, giving trains an added portion of safety, but it would still be necessary to establish an absolute block and proceed not to exceed 79 mph. The ACSES would enforce the 79 mph speed, as well as civil and temporary speed restrictions and positive stops.

e. *Missing transponder. If a transponder is not detected where the equipment expected to find the next transponder, the train must not exceed 125 mph (North End) or 110 mph (South End) until the next valid transponder is encountered. The 125/110 mph speed restriction will be enforced by the system and "--" will be displayed to indicate that the civil speed is unknown. The audible alarm for civil speeds will sound and must be acknowledged. Speed restrictions previously entered into the system, whether temporary or permanent, will be displayed at the proper time and continue to be enforced. If the missing transponder is a positive stop enforcement transponder at the distant signal to an interlocking, then the system will treat the missing transponder as if it were present and a stop will be required. Since the previous transponder will have transmitted the distance to the stop location, the stop shall be enforced unless a cab signal is received that indicates the interlocking signal is displaying an aspect more favorable than "Stop," "Stop & Proceed," and "Restricting." The 125/110 mph speed restriction will also be enforced regardless of whether the cab signal aspect is being received.*

Explanation and analysis. Permanent transponders would be programmed with information that includes distance to the next transponder. Wheel rotations would be logged to determine train position between transponders. If a transponder is missing (or is not successfully read), speeds would be slowed to 125 or 110 mph, depending upon the territory involved, until the next valid transponder is detected.

8. *When it becomes necessary to cut out the cab signal/ATC system, the ACSES, or both, these systems shall be considered inoperative until the engine has been repaired, tested*

and found to be functioning properly. Repairs shall be made before dispatching the unit on any subsequent trip.

9. Other requirements applicable to the system are as follows:

a. Aspects in the cab shall have only one indication and one name and will be shown in such a way as to be understood by the engine crew. These aspects shall be shown by lights and/or illuminated letters or numbers.

b. Entrances to the main line can be protected by electrically locked derails if the speed limit is 15 mph or less. A transponder set shall cut in the ACSES prior to movement through the derail and onto the main line. If the speed limit is greater than 15 mph, a positive stop will be required. At entrances from a signaled track, the ACSES shall be cut in prior to the distant signal and a positive stop enforced at the home signal.

c. An on-board event recorder shall record, in addition to the required functions of § 229.5(g) [of FRA's Railroad Locomotive Safety Standards (49 CFR Part 229)], the time at which each transponder is encountered, the information associated with that transponder, and each use of the positive stop override. These functions may be incorporated within the on-board computer, or as a stand alone device, but shall continue to record speeds and related cab signal/ATC data, even if ACSES has failed and/or is cut out. The event recorder shall meet all requirements of § 229.135.

Explanation and analysis. FRA has determined that event recorders enhance railroad safety. Whether they are used to aid accident analysis, to monitor locomotive engineers' performance, or to monitor equipment performance, event recorders provide data that are free

from bias, free from the inconsistent powers of human observation, and free from the possible taint of self-interest. There has been no question of the cab signal/ATC events being recorded; what FRA is ensuring is that the ACSES portion of the system is recorded and made available as well.

10. The following maximum speeds apply on the NEC in territory subject to this order:

a. In ACSES territory where all trains operating on high-speed tracks, adjacent tracks, and tracks providing access to high-speed tracks are equipped with cab signal/ATC and ACSES, qualified and ACSES-equipped trainsets otherwise so authorized may operate at maximum speeds not exceeding 150 mph. The maximum speed over any highway-rail crossing shall not exceed 80 mph.

b. In ACSES territory between Washington, D.C., and New York City, New York, where access to any high-speed track is barred by switches locked in the normal position and a parallel route to the high-speed track is provided, at crossovers from adjacent tracks, and where no junctions providing direct access exist, qualified and ACSES-equipped trainsets otherwise so authorized may operate to a maximum speed not exceeding 135 mph on such track; and provisions of this order requiring other tracks and trains to be equipped with the ACSES do not apply.

Explanation and analysis. Currently maximum speeds for trains on the general rail system are limited to 110 miles per hour. Under a waiver, Amtrak operates Metroliner service between New York and Washington at speeds up to 125 miles per hour. This proposed order would allow Amtrak to increase its speeds on the South End of the NEC to 135 miles per hour by installing the ACSES transponders on the wayside and equipping new high-speed trainsets

with on-board scanners and computers. Other users of Amtrak's South End high-speed tracks would not be required to be equipped for the present, but would benefit from the higher level of safety associated with Amtrak operations. As noted above, other users have already begun to recognize the value of the ACSES technology, and eventual equipping of all NEC users is expected (but would not be required under this order).

On the North End, maximum speeds top out at 110 mph. No waiver exists for high-speed service. This order would authorize operation of qualified trainsets at up to 150 miles per hour in territory where Amtrak has installed ACSES on the wayside, provided Amtrak and other users are equipped. This authority would apply equally to the North and South Ends provided the specified conditions are met.

Speeds over highway-rail crossings would be limited to 80 mph, the maximum speed planned under the NEC program until very recently. This limit is lower than the 110 mph cap included in current guidelines for high-speed corridors (absent barrier and presence detection systems tied into the signal system). Density of NEC operations and the increased possibility that a collision with a motor vehicle might cause a secondary collision between trains operating at combined very high closing speeds suggests the need for appropriate caution. FRA reserves the right to allow higher speeds over individual highway-rail crossings after demonstration by Amtrak that appropriate safety measures have been implemented.

The phrase "otherwise authorized," as applied to trains, refers to equipment qualified for higher speeds in track\vehicle interaction limits proposed in FRA's Track Safety Standards NPRM. Metroliner equipment is currently authorized to operate up to 125 miles per hour. FRA anticipates that the new American Flyer trainsets will be qualified to operate up to 150 miles per hour. It is possible that other equipment presently operating on the NEC might be qualified to

operate at higher than conventional speeds under the procedures of the proposed Track Safety Standards revisions.

At present, specific regulatory action applicable only to the NEC includes conditional waiver authority for operation of Metroliner equipment to 125 miles per hour and requirements for use of the cab signal/ATC system by all operators. FRA reserves the right to merge some or all of these provisions in the final order. Comment is requested regarding the appropriateness of doing so.

Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by Government regulations. FRA certifies that this proposed order would not have a significant economic impact on a substantial number of small entities. As explained below in the Regulatory Impact Analysis, the proposed order would limit its hours of application to minimize impact on the only small entity affected, the Providence and Worcester Railroad.

Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995 (PRA), Pub. L. No. 104-13, § 2, 109 Stat. 163 (1995) (codified as revised at 44 U.S.C. §§ 3501-3520), and its implementing regulations, 5 CFR Part 1320, the Office of Management and Budget (OMB) does not need to approve information collection requirements that affect nine or fewer respondents. FRA has determined that information collection requirements in this proposed order would affect only five railroads, and that therefore OMB approval is not required.

Regulatory Impact

Executive Order 12866 and DOT Regulatory Policies and Procedures

This rule has been evaluated in accordance with existing policies and procedures. It is believed that the rule will be determined to be non-significant under both Executive Order 12866 and DOT policies and procedures (44 FR 11034; February 26, 1979). FRA has prepared and placed in the docket a regulatory analysis addressing the economic impact of the proposed rule. Document inspection and copying facilities are available at 1120 Vermont Avenue, 7th Floor, Washington, D.C. Photocopies may also be obtained by submitting a written request to the FRA Docket Clerk at Office of Chief Counsel, Federal Railroad Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FRA has analyzed the benefits and costs of upgrading the signal systems in the NEC to the ACSES system. The NEC has many unique aspects, and many of the economic issues arising in analysis of this proposal are extremely complicated. It appears that there would be significant safety costs were FRA not to order significant upgrades to the signal systems in the NEC.

Amtrak and NJT have sound business reasons for adopting the proposed transponder-based system, but safety benefits will also accrue in large measure to society. FRA estimates that societal direct safety benefits will be more than $200,000,000. The system will cost approximately $95,000,000 (an amount which will accrue over several years, approximately $36,000,000 of which will be imposed directly by this order, implementing the first phase) so the net benefit will be approximately $105,000,000. There will also be benefits beyond the direct safety benefits, such as the ability to improve traffic flow and to divert traffic from modes with greater societal costs. There will also be benefits from the improvement and demonstration of advanced signal technology.

This proposed order would facilitate the orderly introduction of enhanced passenger rail service on the NEC, consistent with Congress' statutory direction. The order would recognize Amtrak's investment in development and deployment of advanced technology that will enforce civil speed restrictions and positive stops at key locations along the railroad. Amtrak is also making significant investments in a new 9-aspect signal system and improvements in track and structures that will benefit all NEC users through more efficient operations and improved safety.

The proposed order would require that controlling locomotives (including electrical multiple-unit vehicles and cab cars) on the NEC be equipped with on-board ACSES equipment. This burden would fall on commuter railroads, freight railroads, and Amtrak, in proportion to the number of trains those entities operate on the NEC. A risk assessment study conducted for Amtrak and discussed with other NEC interests in the Northeast Corridor Safety Committee illustrated the importance of a more secure train control system in avoiding any increase in system risk as train movements and speeds increase on the North End over the coming decades.

One on-board ACSES unit is expected to cost approximately $40,000. North End users exclusive of Amtrak are expected to require approximately **450** units, for a total cost of **about $18,000,000.** Each of these users will experience direct benefits in safety and liability avoidance. Potential benefits could result from higher average train speeds if the proposed higher levels of unbalance in the Track Safety Standards NPRM are adopted.

FRA has considered the proposed system's effect on small entities. Only one small entity, the Providence and Worcester Railroad (PW), will be affected. To minimize the impact on this small freight railroad, FRA will limit the hours of application of the proposed order to allow the PW to continue operations without equipping most of its fleet with new ACSES units.

Proceedings on this Proposed Order

FRA seeks public comment on this proposed order and related matters, including any authorization that may be required for Amtrak to implement a modified cab signal system on the NEC. FRA has placed in the docket of this proceeding copies of Amtrak's program description for the ACSES system, proposed operating rules for use in conjunction with the system, and other related information, including current Amtrak projections for operating speeds over highway-rail crossings on the North End.

No public hearing is presently planned in this proceeding. However, FRA will convene such a hearing if a request is received within 45 days from publication of this notice. FRA does intend to convene the Northeast Corridor Safety Committee following the close of the comment period to consider public comments received and provide advice for resolving remaining issues. FRA will provide notice of this meeting, which will be open to the public, and will include the minutes of the meeting in the docket of this proceeding.

Authority: 49 U.S.C. 20103, 20107, 20501-20505 (1994); and 49 CFR 1.49(f), (g), and (m).

Issued in Washington, D.C. on

Donald M. Itzkoff
Deputy Administrator
Federal Railroad Administration