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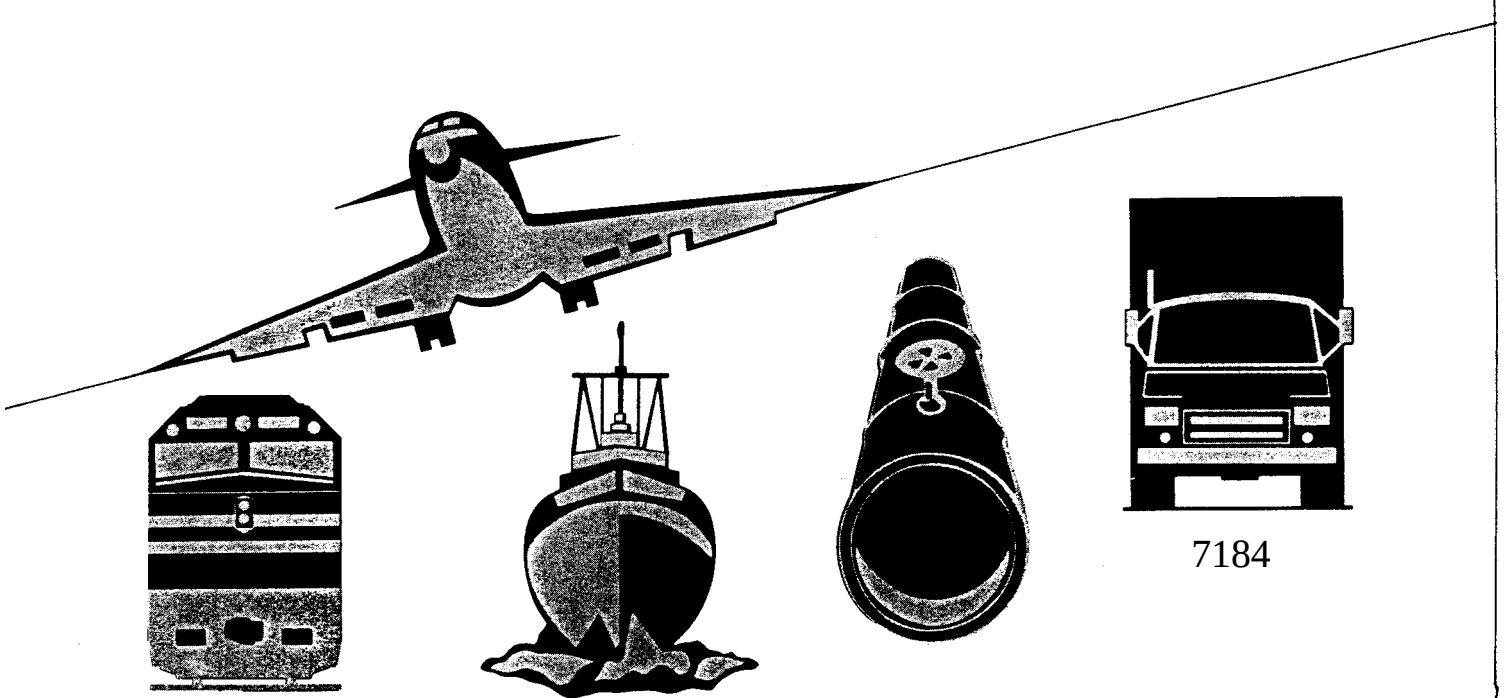
NTSB/SIR-99/03

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

RAILROAD SPECIAL INVESTIGATION REPORT

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT RAILROAD SAFETY ASSESSMENT



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National Transportation Safety Board. 1999. ***Northern Indiana Commuter Transportation District Railroad Safety Assessment.*** **Railroad Special Investigation Report NTSB/SIR-99/03. Washington, DC.**

Abstract: About 4:31 a.m. on June 18, 1998, a westbound Northern Indiana Commuter Transportation District (NICTD) two-car passenger train struck the second semitrailer of a long combination vehicle that consisted of a tractor pulling two flatbed semitrailers loaded with steel coils at a highway-rail grade crossing near Portage, Indiana. Three fatalities and five minor injuries resulted from the accident. In a June 18, 1998, letter to National Transportation Safety Board Chairman James Hall, U.S. Senator Richard Lugar and U.S. Congressman Peter J. Visclosky cited three previous accidents that had involved the NICTD system and expressed concern about NICTD's long-term safe operation. The Safety Board reviewed the accident history of the NICTD system and determined that, given the series of incidents experienced on the NICTD line, an evaluation of NICTD's overall safety should be conducted.

The safety issues discussed in this report are the safety of NICTD grade crossings, the implementation of the NICTD System Safety Program Plan, and the effectiveness of the NICTD corporate safety culture.

As a result of its investigation, the National Transportation Safety Board issued recommendations to NICTD, the Indiana Department of Transportation, and the Boards of Commissioners of Indiana's Lake, LaPorte, Porter, and St. Joseph Counties.

Railroad Special Investigation Report

Northern Indiana Commuter Transportation District Railroad Safety Assessment

NTSB/SIR-99/03
PB99-917004
Notation 7184
Adopted August 10, 1999

National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, D.C. 20594

Contents

Introduction

About 4:31 a.m. central daylight time on June 18, 1998, a westbound Northern Indiana Commuter Transportation District (NICTD) two-car passenger train struck the second semitrailer of a long combination vehicle (LCV) that consisted of a tractor pulling two flatbed semitrailers loaded with steel coils at a grade crossing near Portage, Indiana. When the vehicles collided, the second semitrailer broke away from the first semitrailer and was dragged by the front of the NICTD train while the chain securing a steel coil to the second semitrailer broke. The released steel coil entered the first train car through the front bulkhead and moved into the passenger compartment. Three fatalities and five minor injuries resulted from the accident.

In a June 18, 1998, letter to National Transportation Safety Board Chairman James Hall, U.S. Senator Richard Lugar and U.S. Congressman Peter J. Visclosky cited three previous accidents that had involved the NICTD system and expressed concern about NICTD's long-term safe operation. (See appendix A.) The Safety Board reviewed the accident history of the NICTD system and determined that, given the series of incidents experienced on the NICTD line, an evaluation of NICTD's overall safety should be conducted.

The Safety Board conducted a special investigation that examined the following safety issues:

- Safety of NICTD grade crossings
- Implementation of the NICTD System Safety Program Plan, and
- Effectiveness of the NICTD corporate safety culture

The intent of this special investigation was not to determine whether NICTD is a "safe" or "unsafe" railroad but to examine those elements of its overall operation known to affect safety and to indicate where improvements could be made in these areas. The Safety Board recognizes that factors not examined in this investigation may also affect NICTD safety, either positively or negatively.

As a result of its special investigation, the Safety Board makes safety recommendations to NICTD, the Indiana Department of Transportation (INDOT), and the Boards of Commissioners of Indiana's Lake, LaPorte, Porter, and St. Joseph Counties.

Investigation

To assess NICTD's overall safety, the Safety Board examined the rail system's accident history and safety record, infrastructure and operating practices, safety programs, and corporate safety culture. Investigators placed emphasis on NICTD's internal processes for ensuring safe operations, such as the organization's compliance with its own System Safety Program Plan (SSPP), which "establishes the Safety philosophy of the whole organization and provides the means of implementation."[1] (SSPPs will be discussed in detail later in this report.)

Northern Indiana Commuter Transportation District

General

History—This rail system began in 1903 as the Chicago and Indiana Air Line Railway, a streetcar service between Indiana Harbor and East Chicago. By 1908, the developing rail line stretched across northwest Indiana, extending 68.9 miles from Hammond to South Bend. By 1909, the line operated trains to Pullman, Illinois, where passengers changed trains to continue their journey to downtown Chicago. The system later worked out an agreement with the Illinois Central Railroad in which "Lake Shore" cars were coupled to a steam locomotive at Kensington, Illinois, and hauled into downtown Chicago. In June 1925, the system was renamed the Chicago SouthShore and South Bend Railroad (CSS). During World War II, annual ridership on the CSS, which provided freight as well as passenger service, rose to over 6 million. After that war, the CSS passenger service began a long period of ridership decline.

In 1976, faced with mounting losses and deteriorating railcars, stations, and electrical systems, the CSS asked the Interstate Commerce Commission to allow it to discontinue its passenger service. In 1977, the Indiana General Assembly passed legislation enabling the four counties served by the CSS to create NICTD to maintain the passenger service. (The CSS continued as a freight operation.) Indiana's actions and funds from the State of Illinois and the Federal Government allowed the commuter operation to continue as NICTD.

NICTD ridership is reported to have increased from about 1.6 million people per year in the late 1970s to about 3.5 million per year in 1997. In 1997, NICTD passengers traveled a combined 106 million miles on the railroad. NICTD operates 365 days a year and carries 11,000 to 12,000 commuters each weekday and usually about half that number on weekends and holidays.

[1] American Public Transit Association, *Manual for the Development of System Safety Program Plans for Commuter Railroads* (Washington, D.C.: American Public Transit Association, 1998), p. 5.

Organization—NICTD provides service between the Michiana Regional Airport in South Bend, Indiana, and the Randolph Street Station in Chicago, Illinois. The line is about 90 miles long. NICTD owns all mainline rights of way and track between South Bend and the Indiana-Illinois State line (68.1 miles). NICTD leases 1.1 miles of right of way within the Michiana Regional Airport in Indiana and 6.2 miles of track between the Indiana-Illinois State line and the Kensington Interlocking from the CSS. (See figure 1 for a map of the NICTD track system.) NICTD pays a trackage rights fee to operate on the Chicago Northeast Illinois Regional Commuter Rail Corporation (Metra) Electric District for a distance of 14.3 miles. Metra, the commuter railroad division of the Regional Transportation Authority, subsidizes 21 percent of NICTD's eligible operating losses under a purchase-of-service agreement.

Although NICTD is a commuter railroad, the CSS still operates, as a contracted Class II freight carrier, over NICTD property. The CSS pays maintenance and annual rental fees to NICTD. The CSS operates an average of six trains a day, Monday through Friday, and four trains each weekend day. The freight train movements are commingled with the NICTD passenger train service. The CSS superintendent told Safety Board investigators that most of the CSS freight business involves moving unit coal trains to power generating stations owned by the Northern Indiana Public Service Company and unit coal trains to Bethlehem Steel facilities. (Indiana is one of the Nation's leading States for the production of steel, and northern Indiana has a particularly high level of steel industry activity.) Additionally, the CSS provides direct service to 23 customers on the NICTD line. The CSS connects with 6 other railroads and has 23 points of interchange.

NICTD has about 270 employees. Most of the nonmanagement employees work in one of six department areas—mechanical, transportation, track, line and signal, buildings and bridges, and accounting. In 1990, a municipal transit police force joined NICTD and began operating in fully marked, high-profile police cars with Indiana police license plates. NICTD has five full-time uniformed police officers.

Oversight—NICTD is part of the general railway system and must comply with the appropriate rules and regulations administered by the Federal Railroad Administration (FRA). The FRA is responsible for determining the adequacy of NICTD's compliance with its published rules and regulations and for taking any enforcement action necessary to ensure compliance.

The Safety Board reviewed FRA-provided information about the FRA's inspections of NICTD from January 1993 to January 1998 concerning motive power and equipment, operations, signal, and track. The FRA reported having conducted 443 inspections in these areas over the 5-year period. The inspections resulted in FRA's finding 391 defects and issuing 5 violations. (See appendix B for greater detail on FRA inspection results.) These findings are comparable to those for similar rail operations inspected by the FRA.

In discussing NICTD with Safety Board investigators, the FRA Chicago deputy regional administrator expressed no immediate concern about NICTD train operations or

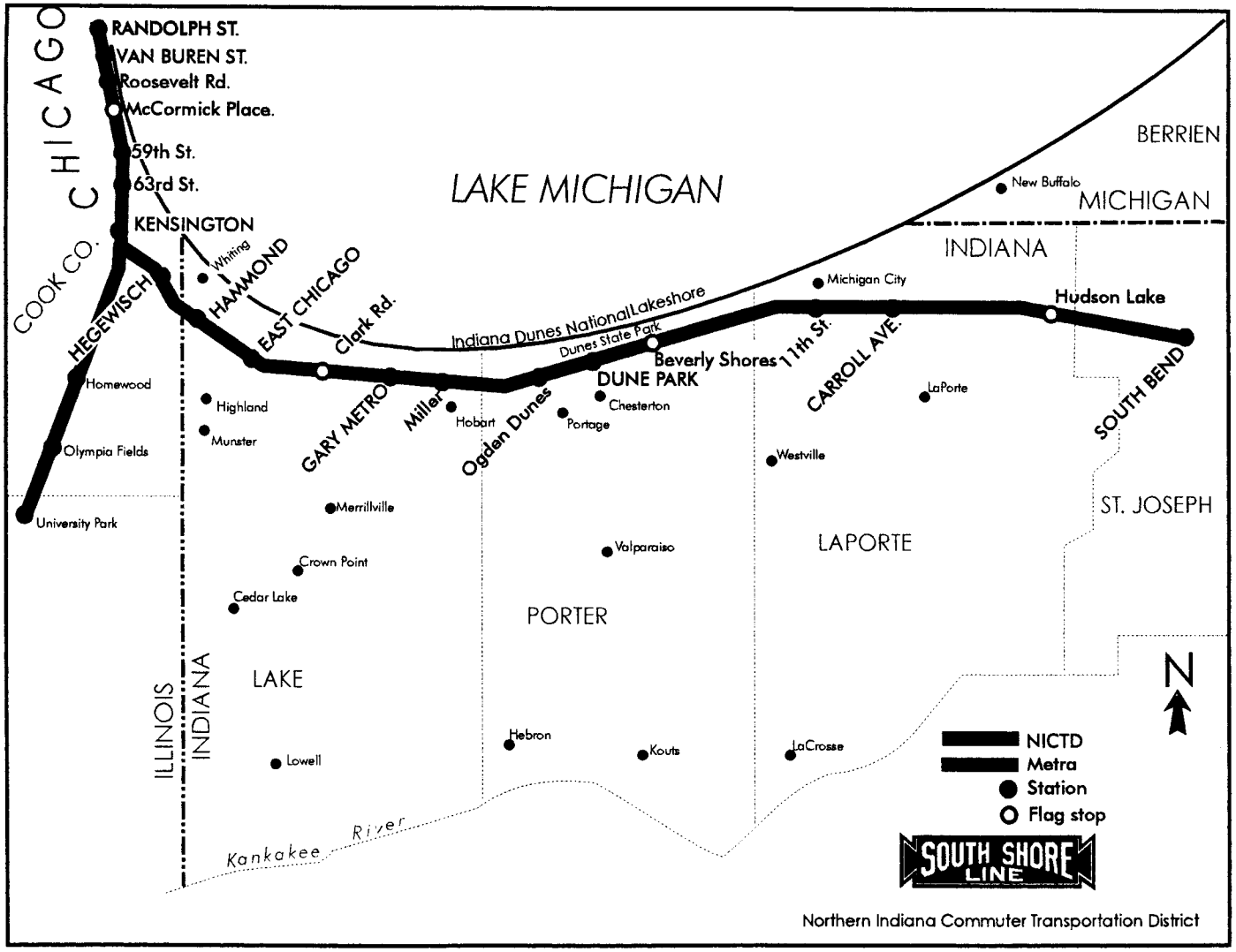

Figure 1. Map of NICTD track system

the safety of passengers on NICTD because of the FRA's relatively positive inspection experience with NICTD.

The FRA-reportable accident records (contained in published FRA accident/incident bulletins) for NICTD and CSS train operations from January 1993 to June 1998 listed the following events:

January 18, 1993[2]	Gary, Indiana	Head-on collision
March 3, 1993	Michigan City, Indiana	Grade crossing
June 16, 1994	Michigan City, Indiana	CSS train derailed one car in shops
September 11, 1994	South Bend, Indiana	Abandoned auto at grade crossing
October 30, 1994	Miller, Indiana	Grade crossing
May 9, 1995	Dune Park, Indiana	Vandalism
June 18, 1998	Portage, Indiana	Grade crossing

The FRA is conducting a series of Safety Assurance and Compliance Program (SACP) meetings with various rail carriers over which it has regulatory authority. FRA representatives told the Safety Board that the meetings are designed to help carriers better understand regulatory compliance requirements. A SACP meeting was held between FRA and NICTD officials in August 1999.

The Federal Transit Administration (FTA) provides financial and technical assistance to local transit systems. Since 1994, NICTD has received $40.7 million in grants from the FTA. The FTA conducts no inspections of NICTD with respect to its commuter operation, nor does it review what use NICTD makes of the grant money it provides. The deputy director of the FTA Office of Safety and Security told the Safety Board that the FTA relies on the FRA to perform any necessary NICTD safety oversight.

NICTD operates within two States—Indiana and Illinois. Neither State exercises safety oversight of NICTD; each refers to the FRA for safety oversight. The INDOT Public Transportation Section (PTS) administers funds to public transit systems to help them offset operating and capital expenses. The systems also use the funds to match Federal grant funds. The PTS is responsible for financial oversight and requires each public transit system to submit quarterly and annual reports that include financial and operating information. Each system must submit an annual audit to the PTS office. Between 1993 and 1998, NICTD submitted reports to INDOT as required. NICTD received about $7 million in State funds from INDOT in 1997.

The Illinois Commerce Commission (ICC) railroad section's jurisdiction over railroads is described in the Illinois Compiled Statutes, chapter 625 (*Illinois Vehicle Code*,

[2] National Transportation Safety Board, *Collision Between Northern Indiana Commuter Transportation District Eastbound Train 7 and Westbound Train 12 Near Gary, Indiana, on January 18, 1993*, Railroad Accident Report NTSB/RAR-93/03 (Washington, D.C.: National Transportation Safety Board, 1993).

IVC), act 5, chapter 18c, parts 7101 through 7504. The safety requirements delineated for track, facilities, and equipment are consistent with those of the FRA and have been adopted by Illinois. The ICC does not inspect railroad equipment, perform operational oversight of train movements, or conduct track inspections. The ICC told Safety Board investigators that NICTD had not had an accident or incident reported in Illinois since 1993.

Major Accident History

The Safety Board has developed reports on four accidents that occurred on NICTD property. Since 1985, the Safety Board has made eight safety recommendations to the CSS, which operates on NICTD tracks. All eight recommendations were "Closed—Acceptable Action" or "Closed—Acceptable Alternate Action."

New Carlisle, Indiana, 1984—This accident occurred on May 18, 1984, when a CSS train derailed at a switch near New Carlisle, Indiana.[3] The probable cause of the accident was a broken switch crank, which allowed the switch to gap. After the accident, the Safety Board issued one safety recommendation to the CSS on June 28, 1985:

> R-85-75
>
> Install a switch point lock on each hand-operated switch over which passenger trains make facing point movements.

The recommendation was "Closed—Acceptable Action" on February 17, 1987.

Gary, Indiana, 1985—This accident occurred on January 21, 1985, near Gary, Indiana, when two CSS trains collided head-on west of the Gary Station platform.[4] The Safety Board determined that the probable cause of this accident was the failure of the dispatcher to coordinate the movement of the two trains properly; the lack of a clear provision in General Notice No. 62 for a meeting of two opposing trains scheduled to depart Gary Station at the same time; and the mistaken determination by the crew of eastbound train No. 123 while at Clark Road Station that there was sufficient time for the train to reach Gary Station and clear the single track before the scheduled departure of westbound train No. 218.

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[3] National Transportation Safety Board, *Derailment of Commuter Train No. 20 Chicago SouthShore and South Bend Railroad, New Carlisle, Indiana, May 18, 1984,* Brief of Railroad Accident CHI84FR003 (Washington, D.C.: National Transportation Safety Board, 1985).

[4] National Transportation Safety Board, *Head-on Collision of Chicago SouthShore and South Bend Railroad Train Nos. 123 and 218, Gary, Indiana, January 21, 1985,* Railroad Accident Report NTSB/RAR-85/13 (Washington, D.C.: National Transportation Safety Board, 1985).

On November 13, 1985, the Safety Board issued seven safety recommendations to the CSS:

R-85-106 (Closed—Acceptable Alternate Action; October 7, 1987)

Provide for a 3-minute delay similar to that in rule 83A for all operations involving single track operating rules at locations where the arrival and departure times of opposing trains are in conflict.

R-85-107 (Closed—Acceptable Action; February 11, 1986)

Require that 'Call Orders' be issued to train crews to call the dispatcher before a train enters the single track section when single track operating procedures and rules are established temporarily in double track territory.

R-85-108 (Closed—Acceptable Action; October 7, 1987)

Install a tape-monitoring system to record and preserve a record of communications to and from the dispatcher on the dispatcher's telephone and radio circuits.

R-85-109 (Closed—Acceptable Action; February 11, 1986)

Establish a reliable reporting system to provide the dispatcher more accurate passing times of trains entering upon the Chicago SouthShore and South Bend tracks at Kensington Interlocking for use in estimating the movement of trains.

R-85-110 (Closed—Acceptable Alternate Action; October 7, 1987)

Modify the power-monitoring system so that the time trains pass the substation can be identified more readily, and require the dispatcher to record those times promptly on his train sheet.

R-85-111 (Closed—Acceptable Action; February 11, 1986)

Provide written instructions to operating personnel concerning the action required when a train encounters a stop-and-proceed signal aspect in a section of track where no propulsion power is available.

R-85-112 (Closed—Acceptable Action; March 15, 1988)

Develop a comprehensive curriculum covering the critical elements and job skills, including communication skills and manner for each position, and require that an employee pass a uniform examination before being advanced to a new position.

Gary, Indiana, 1993—At 9:34 a.m. on January 18, 1993, NICTD eastbound commuter train 7, traveling from Chicago, Illinois, to South Bend, Indiana, and NICTD westbound commuter train 12, traveling from South Bend to Chicago, collided at milepost 61.1 in Gary, Indiana.[5] Seven passengers died and 95 people were injured.[6] Damage to the two trains was estimated at $854,000.

The Safety Board determined that the probable cause of the collision between the two NICTD trains was the inattentiveness of the engineer on train 7, resulting in his train passing a stop signal and partially blocking the westbound track. Contributing to the severity of the accident was the failure of the engineer on train 12 to take timely action to slow or stop his train before the collision. Contributing to the severity of the injuries was the breach of the passenger compartment in the lead cars of both trains.

The Safety Board issued recommendations concerning crashworthiness and rail personnel fitness to the FRA, the FTA, the American Public Transit Association (APTA),[7] the Association of American Railroads, and the American Short Line Railroad Association.

Portage, Indiana, 1998—About 4:31 a.m., June 18, 1998, the westbound two-car NICTD train 102 struck the second semitrailer of an LCV that consisted of a tractor pulling two flatbed semitrailers loaded with steel coils at the National Steel Corporation's Midwest Steel Division grade crossing near Portage, Indiana. The LCV had entered the crossing and proceeded via the northbound lane toward the entrance to the Midwest Steel plant. The Midwest Steel grade crossing traversed two sets of railroad tracks, the NICTD and the Consolidated Rail Corporation (Conrail) main tracks. The LCV proceeded over the NICTD main tracks and approached the Conrail main tracks. (In June 1999, the Conrail operation in this area was taken over by the Norfolk Southern Corporation.) As the LCV was crossing the NICTD tracks, the grade-crossing signals for the Conrail track activated and the gates lowered in front of the LCV tractor. The driver stopped the LCV before the Conrail south grade-crossing gate, which caused the LCV's second semitrailer to stop on the westbound NICTD track.

Meanwhile, NICTD train 102, traveling westbound about 68 mph, was approaching the Midwest Steel grade crossing. Seeing the LCV on the track, the engineer placed the train in emergency braking, but it did not stop in time to avoid collision. As the collision occurred, the chain that secured a steel coil to the second semitrailer broke. The released steel coil entered the first train car through the control compartment. The coil

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[5] National Transportation Safety Board, *Collision Between Northern Indiana Commuter Transportation District Eastbound Train 7 and Westbound Train 12 near Gary, Indiana, on January 18, 1993*, Railroad Accident Report NTSB/RAR-93/03 (Washington, D.C.: National Transportation Safety Board, 1993).

[6] The FRA database has only 41 injuries associated with this accident because the FRA used criteria different from those used by the Safety Board in developing its injury totals.

[7] APTA is a nonprofit international association of over 1,200 member organizations, including transit systems; planning, design, construction, and finance firms; product and service providers; academic institutions; and State associations and departments of transportation. More than 90 percent of those people using public transportation in the United States and Canada are served by APTA members.

moved about 34 feet into the passenger compartment before coming to rest. Three fatalities and five minor injuries resulted.

Another incident at the Midwest Steel grade crossing took place on July 16, 1998. At 6:34 a.m., the engineer of the eastbound Conrail train MAIL8M, traveling at 60 mph on the No. 2 (inside) track, put the train into emergency braking because he was concerned that a southbound flatbed trailer was extending onto the No. 2 track. According to the engineer, he could not tell whether the trailer was on the track or simply close to it. The engineer said that he was about an "engine length" away when the truck moved forward and a collision was avoided.

Because of the safety problems at the crossing, the Safety Board determined that immediate action was necessary to prevent a recurrence of the June 18, 1998, accident. The Board issued urgent Safety Recommendations R-98-44 to the FRA, R-98-45 to the Federal Highway Administration, R-98-46 to INDOT, and R-98-47 to the National Steel Corporation's Midwest Steel Division. The recommendations called for the organizations to work together to

> Take immediate steps to provide traffic controllers to supervise and coordinate the safe movement of highway and railroad traffic at the Midwest Steel and Wilson Road grade crossings. Ensure that the traffic controllers are able to communicate directly with highway and railroad traffic, and keep the controllers assigned to this duty until permanent engineering changes to these grade crossings can be identified and implemented.

Since August 31, 1998, a traffic controller has been posted to coordinate the safe movement of traffic through the Midwest Steel grade crossing. The FRA, the Federal Highway Administration, INDOT, and the National Steel Corporation's Midwest Steel Division have informed the Safety Board that they are working with the involved railroads to find ways to continue to improve safety and user awareness at the Midwest Steel crossing, as well as to provide grade separation. All the recommendations are currently in "Open—Acceptable Response" status.

In its final report on the 1998 Portage accident, the Safety Board determined that the probable cause of the collision between NICTD train 102 and an LCV (truck) at the National Steel Corporation's Midwest Steel grade crossing was ineffective action by Federal, State, and private agencies to permanently resolve safety problems at the Midwest Steel grade crossing, which they knew to be a hazardous crossing.

The Safety Board issued the following safety recommendations as a result of its investigation of the Portage accident:

> **to the U.S. Department of Transportation:**
>
> Eliminate any differentiations between private and public highway-rail grade crossings with regard to providing funding for, or requiring the implementation of, safety improvements. (I-99-02)

to the FRA:

Work together with the Federal Highway Administration, INDOT, the National Steel Corporation, the Norfolk Southern Corporation, and NICTD to make, within 2 years, permanent engineering changes to the Midwest Steel highway-rail grade crossing that will minimize or eliminate safety hazards at this crossing. (R-99-31)

Determine the extent of the weld quality assurance inadequacies demonstrated by Nippon Sharyo Ltd. in its collision post welds, and implement corrective action as necessary to ensure the strength of the collision posts. (R-99-32)

Require 100-percent nonvisual inspection of all collision post attachment welds made on multiple-unit locomotives and passenger cars during manufacture, and require that inspection records be retained for the life of the car. (R-99-33)

to the Federal Highway Administration:

Work together with the FRA, INDOT, the National Steel Corporation, the Norfolk Southern Corporation, and NICTD to make, within 2 years, permanent engineering changes to the Midwest Steel highway-rail grade crossing that will minimize or eliminate safety hazards at this crossing. (H-99-27)

to INDOT:

Work together with the FRA, the Federal Highway Administration, the National Steel Corporation, the Norfolk Southern Corporation, and NICTD to make, within 2 years, permanent engineering changes to the Midwest Steel highway-rail grade crossing that will minimize or eliminate safety hazards at this crossing. (H-99-28)

to the National Steel Corporation, Midwest Steel Division:

Work together with the FRA, the Federal Highway Administration, INDOT, the Norfolk Southern Corporation, and NICTD to make, within 2 years, permanent engineering changes to the Midwest Steel highway-rail grade crossing that will minimize or eliminate safety hazards at this crossing. (H-99-29)

to the Norfolk Southern Corporation:

Work together with the FRA, the Federal Highway Administration, INDOT, the National Steel Corporation, and NICTD to make, within 2 years, permanent engineering changes to the Midwest Steel highway-rail grade crossing that will minimize or eliminate safety hazards at this crossing. (R-99-34)

to NICTD:

Work together with the FRA, the Federal Highway Administration, INDOT, the National Steel Corporation, and the Norfolk Southern Corporation to make, within 2 years, permanent engineering changes to the Midwest Steel highway-rail grade crossing that will minimize or eliminate safety hazards at this crossing. (R-99-35)

Inspect the collision post welds of all Nippon Sharyo Ltd. railcars in your fleet and repair any welds that are deficient. (R-99-36)

Also as a result of its Portage investigation, the Safety Board reiterated the following safety recommendation:

to the U.S. Department of Transportation:

Develop a standardized hazard index or a safety prediction formula that will include all variables proven by research or experience to be useful in evaluating highway-rail grade crossings, and require the States to use it. (H-98-33)

Safety Record

Railroads report accidents and incidents to the FRA using two forms: FRA F6180.54, the *Rail Equipment Accident/Incident Report* (RAIR), and FRA F6180.57, the *Highway-Rail Grade Crossing Accident/Incident Report* (GXIR). The RAIR is filed for any "safety-related event involving on-track rail equipment (both standing and moving) causing monetary damage to the rail equipment and track above a prescribed amount" (the 1998 threshold was $6,600). The GXIR is filed in response to any "impact between a rail and highway user (both motor vehicles and other users of the crossing) at a designated crossing site, including walkways, sidewalks, etc., associated with the crossing."[8] Grade-crossing accidents that result in damages of, or greater than, $6,600 are reported on both forms.

NICTD experienced 12 grade-crossing accidents from 1990 through 1998 that resulted in damage exceeding the RAIR dollar threshold. NICTD experienced a total of 68 grade-crossing incidents during this period. On average, NICTD experienced 1.63 grade-crossing accidents per million train miles traveled during the 9-year period.

NICTD reported 22 nongrade-crossing accidents during the 1990 through 1998 period. Before 1998, NICTD's nongrade-crossing accident rate was 2.31 per million train miles. NICTD experienced 7 nongrade-crossing accidents in 1998, which raised the railroad's cumulative nongrade-crossing accident rate to 3.0 per million train miles for the period.

[8] FRA, http://safetydata.fra.dot.gov/officeofsafety, 1999.

NICTD Infrastructure and Operating Practices

Operations

The train dispatcher's office in Michigan City, Indiana, controls NICTD train operations. Eleven substations supply 1,500 volts DC to an overhead catenary for propulsion power. The maximum authorized speed on the track is 79 mph.

About 58 NICTD railroad commuter cars currently operate from the overhead catenary. Nippon Sharyo Seizo Kaisha Ltd. of Toyokowa, Japan, manufactured the cars.[9] NICTD put 43 cars, each with 93-passenger seating capacity, in service in 1982 and 1983. NICTD added 7 powered cars and 10 nonpowered trailers, each with 110-passenger seating capacity, to its operation in 1992.

Powered cars are self-propelled by four DC traction motors, one on each axle. Each car is capable of independent two-way operation and is equipped with two pantographs, one at each end of the car roof. Each car is also equipped with automatic couplers, which connect the pneumatic and electrical train control systems. If necessary, the cars can be connected to a diesel locomotive.

The cars are designed so that equipment components requiring inspection and maintenance are readily accessible. To ensure that components can be removed or serviced, NICTD cars have identification and access doors and panels to the equipment spaces. The underfloor equipment has been arranged and identified to allow ready access from maintenance pits or the side of the car.

NICTD cars receive unscheduled maintenance (for defects that occur during daily use), scheduled maintenance, and "mid-life" maintenance. Maintenance employees, consisting of 4 supervisors, 13 car men, 11 electricians, and 5 machinists, perform the scheduled and unscheduled maintenance. A separate group of seven car men and seven electricians perform the mid-life maintenance.

Federal regulations[10] require daily and periodic inspections. Qualified NICTD inspectors conduct these inspections. Written records are stored on the units and at the departmental office in Michigan City. Periodic inspection is required every 92 days; NICTD routinely performs such inspections every 60 days.

NICTD is working to increase its fleet size. Its entire mechanical department meets regularly with Klauder and Associates[11] and carries out a detailed planning process for equipment procurement operations. NICTD senior managers, supervisors, mechanical engineers, and line-level mechanics participate in the discussions and meetings. Topics

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[9] Nippon Sharyo Seizo Kaisha Ltd. is now operating under the name Nippon Sharyo Ltd. Sumitomo Corporation of America handled commercial arrangements for the NICTD car transaction.

[10] Title 49 *Code of Federal Regulations* (CFR) Part 229, "Railroad Locomotive Safety Standards," Subpart B–Inspections and Tests.

[11] A firm that provides technical consultation and quality assurance regarding railcars.

routinely discussed include existing equipment performance history as it relates to failure rates, reliability, parts availability, and the potential transition from electromechanical propulsion to some form of solid-state technology.

NICTD train operating rules are in *The Chicago SouthShore and South Bend Railroad and Northern Indiana Commuter Transportation District, Rules and Regulations for the Government of the Operating Department*. The rule book became effective on September 1, 1986, and was revised in April 1990. NICTD uses a timetabled train order system with wayside automatic block signals (ABS). The timetable in use became effective at 4:01 a.m., August 25, 1996. NICTD issues general notices and circulars as needed.

The *N.I.C.T.D. Strategic Plan*, dated July 1992, details NICTD's operational goals. NICTD's chief operating officer, through the superintendent of transportation, administers the operational and test inspection program. The trainmaster and senior trainmaster do most testing. In a July 16, 1997, letter to the FRA associate administrator for safety, the NICTD superintendent of transportation described NICTD's operations testing program as being in compliance with the FRA's *Notice of Safety Directive* published on June 30, 1997.

Track

The main NICTD track is constructed with 115-pound continuous-welded rail, secured to 7- by 8-inch by 9-foot crossties (most are made of timber, but some are 9-foot concrete ties and "Nucore"[12] concrete ties). The ties rest in FRA-specification No. 3 crushed limestone ballast, maintained to 12-inch shoulders.

NICTD's written track maintenance standard plan is the *NICTD Maintenance of Way Quality Assurance Manual*. Standards in the manual are more restrictive than those set forth by the FRA in 49 CFR Part 213, "Track Safety Standards." The manual satisfies the track safety requirements detailed in the NICTD SSPP. A consultant drafted the *Maintenance of Way Quality Assurance Manual*, with input from the NICTD track engineer. The manual also contains the NICTD bridge inspection policy and the standards for signal maintenance and construction.

The NICTD track engineer is responsible for overseeing the track department; he is a civil engineer whose experience began in 1969 with the Akron Youngstown Railroad and included work on the Denver and Rio Grande Western Railroad. His staff consists of an assistant track engineer, a supervisor of track inspections, and 32 to 35 contract (union) employees. The assistant track engineer is responsible for the day-to-day operation of the maintenance crews and various administrative assignments. The supervisor of track inspections performs track inspections via a Hy-Rail vehicle twice a week. The switches receive a walking inspection once a month, and the curves receive periodic walking inspections. The supervisor of track inspection also sets the priorities for the work of the track maintenance crews. The NICTD track department has crews stationed in Michigan City, Gary, and Ogden Dunes, Indiana.

[12] These are short 2-foot ties connected by structural I-beams; each rail is supported on a tie.

The NICTD track department has fully implemented the Roadway Workers' Protection Act,[13] which is designed to prevent accidents and maintenance-of-way workers' casualties caused by moving railroad cars, locomotives, or roadway maintenance machines on rail rights of way. NICTD uses "form–B" orders for exclusive track occupancy. The forms are issued to all trains through their track permits. If a train is to enter an area covered by a form B, train personnel must call the person in charge of the track occupancy and request permission to enter and pass through the work limits. Until permission is received, the train may not enter the work limits.

NICTD inspects the main track rail for internal defects using leased rail detector cars. According to the track engineer, NICTD has never had a geometry car on the property. The track inspector determines cross-level compliance during walking inspections.

Safety Board investigators took a number of trips over NICTD tracks by train and Hy-Rail vehicles. During the Hy-Rail trips, stops were made to permit more thorough inspection of the track and structures. No anomalies were found.

NICTD requires all track employees to qualify on the *NICTD Book of Rules* annually. (At this time, most track employees are qualified, and NICTD intends all to be qualified eventually.) Freight carriers and other commuter properties do not normally require this annual rules qualification, and the FRA does not mandate it.

Based on the preceding information concerning NICTD track maintenance programs and policies, the Safety Board concludes that NICTD does not appear to have significant deficiencies in its track maintenance program.

Structures

NICTD provided the Safety Board a copy of its bridge inspection policy. The stated purpose of the policy is to provide an assurance of safety in the use of bridges on or over the railroad. Inspections are not limited to bridges owned by the railroad. NICTD owns and maintains 34 bridges. It operates over and maintains another five bridges owned by the CSS. In addition, six highway bridges cross NICTD tracks.

Bridge inspections covered under this policy are categorized as annual, periodic, special-detailed, or emergency. Bridge inspection safety is covered by company rules and 49 CFR Part 214. Inspection procedures and techniques reference those of the American Railway Bridge and Building Association (now part of the American Railway Engineering and Maintenance of Way Association) and the American Railway Engineering and Maintenance of Way Association. In addition, NICTD cites the University of Tennessee Transportation Center and the U.S. Department of Transportation as procedural sources.

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[13] This legislation enacted 49 CFR Part 214, "Railroad Workplace Safety," Subpart C–Roadway Worker Protection, as amended on December 16, 1996.

NICTD bridge inspection records show 59 bridge structures inspected by NICTD.[14] NICTD operates over 42 of these bridges; the remaining 17 are highway overpasses. Thirty-nine bridges are listed as NICTD's maintenance responsibility. The other 20 are either owned or maintained by the CSS or the State and/or local governing highway agency.

The 1998 NICTD engineering department bridge inspection report, completed October 1998, stated that all bridges had been inspected and found to be in satisfactory condition to carry traffic. The report recommended repairs or maintenance for 28 bridges, as well as future inspections. Only minor repairs were recommended.

The failure of a pin-plate on one bridge (No. 61.07) structure prompted NICTD to conduct a fatigue analysis to estimate the remaining life of major structural components. A contracted consulting firm performed the inspection and evaluation, which was completed during July 1997. Based on estimated traffic volumes, the analysis showed that the fatigue life of the stringers had been consumed. The consultant made no recommendations.

The consultant completed more inspections and evaluations of bridges (Nos. 54.73, 47.32, 63.37, 61.07, and 50.11) in November 1997. The consultant found that, based on the inspection and analysis, the age of the structures, and the serious fatigue damage to hangers of the trusses, rehabilitation of the floor system was not an option. The consultant recommended a bridge replacement schedule (to which NICTD is adhering). The bridges ranged in age from 90 to 102 years. Closer monitoring was recommended for bridge Nos. 54.73 and 47.32 after every 2 to 3 million gross tons of traffic. In addition, the consultant recommended that special handling and speed reductions be enforced for loads heavier than 263,000 pounds and newer AC locomotives with axle loads greater than 65,750 pounds. NICTD has implemented or is in the process of implementing the consultant's recommendations.

According to the NICTD general manager (GM), the latest NICTD gross tonnage report shows 10.3 million gross tons of traffic annually, and NICTD has programmed for a periodic floor system inspection every 3 months. Additionally, NICTD has contracted with two other consultants to conduct detailed inspections and ultrasonic testing on the connecting pins. No indications of member cracking or failure have been reported.

The NICTD GM also stated that NICTD is preparing a request for proposals for load-rating work on all structures and will develop special handling instructions for loads in excess of 263,000 pounds. The trainmaster will enforce the special instructions and handling through normal speed restrictions, and the track department will conduct train weight audits.

Further, the GM reported that NICTD has recognized the need to update its bridge rating tables based on the structural evaluations and methods previously used for rating.

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[14] Bridge number totals may not match because inspection reports show double-track bridges supported independently of each other as two spans (bridges), while there is only one bridge number.

NICTD is completing its 5-year plan on bridges, as well as interim repairs to synchronize with the 5-year plan.

Therefore, the Safety Board concludes that NICTD has followed standard engineering practice in contracting structural engineering expertise for evaluating, inspecting, and load-rating its older bridges and has implemented measures to maintain the structures for the safe passage of expected train traffic.

Signals

General—NICTD maintains about 75.5 miles of an ABS system, four interlockings (three controlled by other railroads), and four signaled sidings for passing and meeting trains. The NICTD ABS system consists of 58 miles of single main track and 17.5 miles of double main track. NICTD uses 96.4 track miles of ABS system track.[15] The signal system uses 60 Hz AC and electronic track circuits to detect trains and AC single-wire single-break relay-based common return circuits and DC double-wire double-break line circuits to control signals.

The signal system consists of fixed-block, three-aspect, colorlight signals that supplement the timetable and train order system by establishing space intervals between trains to increase the safety of operations. The block signal system does not convey authority for trains to operate, except for those block signals that are also interlocked.

The Safety Board reviewed NICTD's *Maintenance of Way Quality Assurance Manual*, which contains special instructions governing the maintaining, testing, and inspecting of highway-rail grade crossings and signal systems and apparatus. The manual contains instructions and test result forms. NICTD updated the manual on March 10, 1995.

FRA communications and signal test records[16] were examined in Michigan City, Indiana. The records were on preprinted or computerized forms, contained the required information, and were filed in the office of the supervisory official having jurisdiction.

The monthly signal failure reports[17] inspected for the years 1993 through 1998 showed that three false proceed indications[18] had occurred during the period. NICTD reported one signal activation failure[19] since January 1993. This type of failure suggests to

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[15] Metra maintains the remaining miles of ABS system that NICTD uses.

[16] Test record requirements appear in 49 CFR 234.273 and 236.110.

[17] Signal system failure reporting requirements appear in 49 CFR 233.7.

[18] Failure of an appliance, device, method, or system to function or indicate as required that results in a more favorable aspect than intended or other condition hazardous to the movement of a train.

[19] Failure of an active highway-rail grade-crossing warning system to indicate the approach of a train at least 20 seconds before the train's arrival at the crossing, or to indicate the presence of a train occupying the crossing, unless the crossing has an alternative means of actively warning highway users about approaching trains.

the motorist that it is safe to proceed across the railroad tracks when it is not safe to do so. A shorted insulated joint caused this incident, which occurred on June 19, 1997.

The Safety Board reviewed NICTD-provided FRA signal and train control inspection reports for the period between October 2, 1992, and June 2, 1998, to determine whether trends in noncompliance or safety issues were evident. Seventy-six percent of the inspection reports provided by NICTD showed no exceptions taken to equipment or records inspected. This sample also indicated that, in comparison to similar railroad operations, NICTD's signal inspection record had a lower-than-average defect ratio.

FRA inspections of 20 highway-rail grade crossings resulted in citations of defective conditions at 5 crossings. Fifty-five percent of the defective conditions cited concerned failure to prevent dust or moisture from entering flashing light units and failure to secure other component housings against unauthorized entry. The FRA inspected 300 signal maintenance records and found no exceptions. In addition, the Board reviewed the signal system annual reports[20] for 1993 through 1998. NICTD's reports were up to date and contained the appropriate information. Based on its review of the inspection records and other FRA data, the Safety Board concludes that NICTD appears to be effectively implementing and administering its signal inspection program.

Signal System Control Circuits—In 1990, the FRA performed a systems assessment of various Chicago commuter rail operations, including NICTD. Following this assessment, the FRA recommended that NICTD eliminate AC line circuits and convert to DC line circuits to reduce the potential for grounding. At that time, the NICTD signal system used 60 Hz 110 volt AC single-wire single-break relay-based common return line circuits to control signal aspects.

In an interview with Safety Board staff, the NICTD chief electrical engineer stated that NICTD has a Federal grant to eliminate pole lines, install electronic track circuits, and convert from AC single-wire single-break relay-based common return circuits to DC double-wire double-break line circuits for controlling signals. He also stated that the double-wire double-break circuits provide a higher level of security and reduce potential risks, such as grounds. NICTD has installed 10 track miles of electronic track circuits to eliminate pole lines. The chief electrical engineer stated that he prefers installing electronic track circuits because they provide a platform on which to add automatic cab signals and train control. NICTD's installation of electronic track circuits and conversion of signal control line circuits is about 75 percent complete.

The Safety Board acknowledges that NICTD has made progress in converting its signal system since the FRA's recommendation in 1990. However, in light of the safety problems (such as false proceed signal indications) that can result from electrical grounding and the nearly 9 years since the FRA made the recommendation, the Safety Board is concerned about the pace at which the project is being completed. The Safety Board concludes that NICTD's failure to complete the elimination of AC line circuits and

[20] Signal system reporting requirements appear in 49 CFR 233.9.

conversion to DC line circuits on its signal system may have reduced the system's safety. Because the conversion of signal control circuits would reduce the potential for grounding, it would result in increased NICTD system safety and should be completed as soon as possible. The Safety Board believes that NICTD should complete the conversion or elimination of signal control line circuits within 2 years.

Highway-Rail Grade Crossings

General—The average grade-crossing density for the NICTD system is about 1.74 crossings per route mile.

NICTD told the Safety Board that the NICTD system currently contains 151 crossings, of which 103 are public, 37 are private, and 11 are pedestrian railroad crossings at grade. Forty-two crossings have passive railroad warning devices (crossbuck signs), and 11 crossings have no warning devices. Thus, 53 crossings, about one-third of all NICTD grade crossings, currently have passive or no warning devices. Fifteen of the 42 locations with railroad crossbucks are on private crossings, and all 11 crossings with no warning devices are on private crossings.

On July 21, 1998, the Safety Board adopted a safety study of passive grade crossings that detailed the dangers inherent in many passive grade-crossing arrangements.[21] The study noted that

> In 1996, passive grade crossings accounted for about three-quarters of all grade crossings in the United States; although there is less highway and train traffic at passive crossings than at active crossings, passive crossings accounted for 54 percent of all grade-crossing accidents and 60 percent of all grade-crossing fatalities in that year.[22]

The report further found that

> A systematic and hierarchic approach to improving passive grade crossing safety is needed, an approach that does not depend primarily on the ability of the driver approaching the crossing to see an oncoming train. The hierarchic approach includes grade separation and closure, installation of active warning devices, improved signage, and intelligent transportation systems technology.[23]

The passive grade-crossing safety problems and possible solutions identified in the safety study are applicable to a wide range of rail operations, including NICTD. Eleven passive grade crossings on the NICTD system had no signage or advance warning devices. All were private crossings.

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[21] National Transportation Safety Board, *Safety at Passive Grade Crossings, Volume I: Analysis,* Safety Study NTSB/SS-98/02 (Washington, D.C.: National Transportation Safety Board, 1998).

[22] *Safety at Passive Grade Crossings, Volume I: Analysis,* Safety Study NTSB/SS-98/02, p. 61.

[23] *Safety at Passive Grade Crossings, Volume I: Analysis,* Safety Study NTSB/SS-98/02, p. 64.

The Safety Board understands that NICTD has only limited authority over and responsibility for private crossings. NICTD's main purpose, however, is to provide safe and reliable transportation services to the public. With this charge comes the responsibility to ensure the safety of NICTD's customers and vehicular traffic.

Poor or nonexistent signage provides insufficient information for motorists to make prudent decisions regarding safe courses of action at grade crossings. When motorists make uninformed decisions at grade crossings, the safety of both vehicles and trains is jeopardized. Therefore, the Safety Board concludes that the lack of adequate signage and advance warning devices at some NICTD passive grade crossings poses a risk to NICTD's customers and motorists.

In its 1998 passive grade-crossing study, the Safety Board studied the use of stop signs at passive grade crossings in depth.[24] The Board found that

> Despite concerns about the use of stop signs at passive crossings, the Safety Board believes that the benefits of stop signs at passive crossings outweigh the concerns. Foremost, in the Safety Board's opinion, is the need for a system-wide approach that provides consistent information and instruction to the driver. Specifically, (1) the action required by a stop sign is well understood by drivers, (2) a driver stopped at a crossing has more time in which to detect an approaching train, and (3) sight distance along the tracks when viewed from a stop sign is generally accurate, according to study accident data.

The safety benefits provided by use of stop signs at passive crossings are applicable to the passive grade crossings on the NICTD system that lack signage and advance warning devices. When a stop sign is placed at a passive grade crossing, the driver knows where the crossing is and what action must be taken. Such clear communication of critical information would improve safety at passive grade crossings. Therefore, the Safety Board believes that NICTD should work with INDOT and Indiana's Lake, Porter, LaPorte, and St. Joseph Counties to install stop signs at all NICTD passive grade crossings, unless a traffic engineering analysis determines that installation of stop signs would reduce the safety of the crossing. Any NICTD crossings at which conditions are such that the installation of stop signs would reduce the level of safety should be upgraded with active warning devices or eliminated.

Highway-Rail Grade-Crossing Safety Efforts—NICTD has indicated to the Safety Board that since 1991, two NICTD highway-rail grade crossings have been closed. NICTD is also working to close several other grade crossings on its system.

[24] *Safety at Passive Grade Crossings, Volume I: Analysis,* Safety Study NTSB/SS-98/02, pp. 68-74.

NICTD participates in Operation Lifesaver[25] and makes presentations designed to educate interested parties about the dangers of grade crossings. The NICTD chief of police is on the Indiana Operation Lifesaver Committee and participates in Operation Lifesaver programs. Since the Portage grade-crossing accident in June 1998, NICTD has given two Operation Lifesaver education programs at the Midwest Steel grade crossing, during which NICTD representatives provided truckers with Operation Lifesaver materials about the dangers of highway-rail grade crossings.

NICTD has had a grade-crossing "near-miss" identification program since the mid-1980s. In general, it functions as follows:

- A train engineer experiences what he or she considers a near-miss between the train and a vehicle at a highway-rail grade crossing.
- The engineer notifies the dispatcher of what took place, including the vehicle license plate number, if possible.
- The dispatcher records the information provided by the engineer and documents it in a NICTD "trouble report."
- The engineer fills out a NICTD near-miss report form, blank copies of which are provided in each locomotive cab. The form captures information such as a description of the violating vehicle, the vehicle's license plate number, and whether the violation resulted in an emergency brake application.
- The near-miss form is forwarded to the NICTD police.
- A NICTD police officer tries to locate the identified vehicle.
- The NICTD police department runs a license plate check on that vehicle and sends a crossing violation notice form to the vehicle owner. The form includes a suggestion that the motorist contact the NICTD police and provides the phone number of the NICTD police.
- The motorist typically contacts the NICTD police. (The NICTD chief of police told the Safety Board that the department has had a nearly 100-percent compliance rate, with motorists communicating with the NICTD police after a violation has been reported and a crossing violation notice form issued.)

[25] Operation Lifesaver is a nonprofit, nationwide public education program designed to eliminate collisions, deaths, and injuries at highway-rail intersections and on railroad rights of way. It is sponsored cooperatively by a variety of partners, including Federal, State, and local government agencies, highway safety and transportation organizations, and the Nation's railroads. The program is designed to increase public awareness about the danger where roadways cross train tracks and on railroad rights of way. Operation Lifesaver also seeks to improve driver and pedestrian behavior at highway-rail intersections by encouraging compliance with traffic laws relating to crossing signs and signals. Operation Lifesaver also emphasizes the enforcement of existing traffic and trespassing laws, the consolidation and closure of redundant highway-rail crossings, and the improvement of crossing engineering.

- When contacted, the NICTD police inform the motorist about Operation Lifesaver and the dangers of attempting to maneuver around lowered crossing gates and across the path of an oncoming train.
- Penalties, such as a traffic ticket, may be issued.

If a NICTD police officer is in the grade-crossing area at the time of the violation, the officer immediately tries to respond to the violation and locate the vehicle. Under such circumstances, the police officer usually issues a traffic citation[26] to the violator.

The Safety Board acknowledges NICTD's efforts to decrease the number of violations that motorists commit at highway-rail grade crossings. Nonetheless, NICTD records show that, between 1995 and 1998, a total of 215 highway-rail grade-crossing violations were reported on the NICTD system and 109 traffic citations were issued. NICTD sent 54 highway-rail grade accident or incident reports to the FRA between January 1, 1993, and July 31, 1998. Five fatalities and five injuries were reported to have resulted from these accidents or incidents. Also, on October 21, 1998, while riding in a NICTD cab car en route to Chicago, Illinois, two Safety Board investigators observed four vehicles violating railroad grade-crossing signals. Therefore, the Safety Board concludes that, despite the NICTD near-miss program to educate motorists who violate highway-rail grade crossings, significant numbers of highway-rail grade-crossing violations continue on the NICTD system.

The NICTD near-miss program could be improved. In particular, the current program does not provide NICTD employees feedback about the outcomes of their reports. NICTD employees reporting near-miss incidents and providing identification information about the motorist causing the incident are not told what use is made of the information they provide. They do not know, for example, whether the motorist is issued a traffic citation or other penalty based on their report. In other words, no one tells them the specific results of their participation in the near-miss reporting program. Some NICTD employees told Safety Board representatives that if the NICTD employee reporting the violation were made aware of the result of his or her near-miss report, the employee would be encouraged to continue to report incidents. Consequently, the Safety Board believes that NICTD should revise its near-miss program to provide closure with individuals reporting violations.

Throughout this special investigation, NICTD personnel at both the management and field levels expressed their concern about grade-crossing safety. The NICTD GM said that railroad workers repeatedly told him that their primary safety-related concern was grade crossings. The NICTD chief of police told investigators that every NICTD crossing is a major concern. He stated that

[26] A uniform traffic ticket for the State of Indiana.

> It's just an accident waiting to happen. I mean, ultimately, in any transit or railroad situation, I would think the goal would be complete grade separation. We know that's impossible… but the officers certainly will do their best. Routinely, if there is a broken gate and it's a major crossing with lots of vehicular traffic, the police department will respond with an officer to that location and he'll take up a position there… .

In addition to its Operation Lifesaver and near-miss programs, NICTD has attempted to make its grade crossings safer through engineering. Normally, the State or municipal government having jurisdiction over the highway involved initiates most improvements to highway-rail grade-crossing warning systems. In 1994, however, INDOT allowed railroads under its authority to apply for corridor improvements. NICTD, through the Northwest Indiana Regional Planning Commission, proposed replacing all its 8-inch crossing signal light units with 12-inch units to make the crossings more visible to motorists. NICTD offered to pay all labor costs if the State would pay for the material. INDOT approved the project in August 1995 but did not provide NICTD with funding or materials to proceed. The Safety Board concludes that making grade-crossing signal lights more conspicuous would provide more effective warning and additional stopping time for motorists approaching grade crossings.

During the 4 years since NICTD proposed making its crossing signal lights more visible, Light Emitting Diode (LED) flashing lights have gained acceptance by the railroad industry because of the dramatically increased conspicuity and reliability they provide. NICTD personnel told investigators that when INDOT takes action on the light upgrading project, NICTD will propose using the newer LED flashing light technology. The Safety Board believes that INDOT should assist NICTD in upgrading all 8-inch crossing signal light units on NICTD territory.

In summary with regard to grade-crossing safety on the NICTD system, the Safety Board found through its investigation that several factors point to possible problems in this area. First, NICTD has a relatively high density of grade crossings on its system (approaching two crossings per mile of track), which provides substantial opportunity for grade-crossing accidents to occur. Also, about one-third of NICTD grade crossings have passive or no warning devices, and 11 passive grade crossings on the NICTD system have no signage or advance warning devices. Further, NICTD has experienced a number of grade-crossing accidents and incidents in recent years, and, despite steps taken by NICTD to improve grade-crossing safety, near-miss and other incidents continue to occur at NICTD grade crossings. In addition, NICTD personnel repeatedly expressed concerns about the risks posed by grade crossings. The Safety Board considers that all these factors indicate that a systematic effort on the part of those agencies best equipped to develop methods to improve NICTD grade-crossing safety is needed. Therefore, the Safety Board believes that the U.S. Department of Transportation, INDOT, and NICTD should work together to develop and implement a strategic plan to improve safety at NICTD highway-rail grade crossings.

NICTD Safety Programs

System Safety Program Plan

Following the Safety Board's investigation of the 1996 collision of a Maryland Rail Commuter train with an Amtrak train in Silver Spring, Maryland,[27] the FRA issued Emergency Order No. 20, requiring certain inspections and modifications to commuter train operations and passenger equipment. Among other provisions, Emergency Order No. 20 required each property to submit an emergency preparedness plan and an effective safety program to the FRA. In the section "Interim system safety plans," the order stated that

> The plan shall take into consideration the overall safety of all passengers and crewmembers and shall, at a minimum, address the following opportunities for risk reduction: (A) Use of cab car/multiple unit car… (B) Operating rules… (C) Adverse conditions… (D) Short-term technology enhancements… (E) Crew management… (F) Highway-rail grade crossings… (G) Emergency exit notification… .[28]

Subsequently, the commuter railroads agreed among themselves to fulfill this element of Emergency Order No. 20 by developing and implementing SSPPs with the assistance of the FRA and APTA. The FRA planned to review the interim SSPPs to "determine whether other mandatory action appears necessary to address hazards associated with the subject rail passenger service." With respect to reviewing and approving SSPPs, the FRA is working in partnership with APTA, because APTA has personnel trained and knowledgeable in assessing SSPPs.

APTA, working with the FRA, drafted a *Manual for the Development of System Safety Program Plans for Commuter Railroads*[29] to provide more detailed direction to commuter railroads developing SSPPs in accordance with Emergency Order No. 20. The manual lists 29 elements that should be addressed in every SSPP and states that

> A commuter railroad has the responsibility of maintaining oversight of its safety status and program to ensure all responsibilities are being carried out and coordinated. This process is known as system safety. A commuter railroad establishes an [SSPP] by formalizing this process in a written document.

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[27] National Transportation Safety Board, *Collision and Derailment of Maryland Rail Commuter MARC Train 286 and National Railroad Passenger Corporation AMTRAK Train 29 Near Silver Spring, Maryland, on February 16, 1996*, Railroad Accident Report NTSB/RAR-97/02 (Washington, D.C.: National Transportation Safety Board, 1997).

[28] FRA, *Commuter and Intercity Passenger Railroads, Including Public Authorities Providing Passenger Service, and Affected Freight Railroads—Emergency Order Requiring Enhanced Operating Rules and Plans for Ensuring the Safety of Passengers Occupying the Leading Car of a Train*, Emergency Order No. 20, Notice No. 1, February 20, 1996 (Washington, D.C.: U.S. Department of Transportation, 1996).

[29] APTA, *Manual for the Development of System Safety Program Plans for Commuter Railroads* (Washington, D.C.: American Public Transit Association, 1998).

> The overall goal of a System Safety Program for commuter railroads is to identify, eliminate, minimize, and/or control safety hazards and their attendant risks by establishing requirements, lines of authority, levels of responsibility and accountability, and methods of documentation for the organization.[30]

As the primary reasons for implementing an SSPP, the manual cites to

- Establish a safety program on a systemwide basis,
- Provide a medium through which a property can display its commitment to safety,
- Provide a framework for the implementation of safety policies and the achievement of related goals and objectives,
- Satisfy Federal and State requirements,
- Meet accepted industry standards and compliance assessment provisions, and
- Satisfy self-insurance provisions. [31]

On October 15, 1997, NICTD management submitted an SSPP to APTA. This draft SSPP largely reflected and formalized those safety practices that NICTD was already following. APTA did not approve the plan NICTD initially submitted; APTA returned it to NICTD with a critique that stated that the draft SSPP was not sufficiently thorough. Using the APTA comments and guidance, NICTD redrafted the SSPP and submitted a revised document that was broader in scope to APTA on April 8, 1998. NICTD included each of the 29 elements provided in the *Manual for the Development of System Safety Program Plans for Commuter Railroads* in its redrafted SSPP. APTA approved the second submission.

The NICTD superintendent of transportation began the drafting of the NICTD SSPP, and the manager of human resources completed the document and began its implementation. He told investigators that NICTD managers had met concerning the SSPP during the implementation process. NICTD accepted comments on the document format, and meeting participants discussed plans for SSPP implementation. No defined implementation plan was adopted. The original date for the SSPP implementation was May 1998. NICTD later postponed the implementation date to September 1998 and then delayed it further.[32] Ultimately, NICTD set no date for full implementation of the SSPP. The NICTD manager of human resources told investigators that "basically the plan is implemented [in effect] but not specifically, and now we have to live with it." He said NICTD should amend the plan and place it in a three-ring binder to make it more "user

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[30] *Manual for the Development of System Safety Program Plans for Commuter Railroads,* pp. 3 and 6.

[31] Manual for the Development of System Safety Program Plans for Commuter Railroads, p. 5.

[32] NICTD told investigators that complications caused by the June 18, 1998, Portage accident were one source of the implementation delay.

friendly," as well as develop a system for monitoring compliance with the SSPP. According to the GM, NICTD is implementing the SSPP but has not completed the process.

The investigative team also interviewed the NICTD chief operating officer, chief engineer (mechanical department), track engineer, director of safety and training (DST), and superintendent of transportation about SSPP compliance within NICTD. Those interviewed said that they knew the SSPP is a relatively new document mandated by the FRA. NICTD has issued the document to all its managers, and NICTD personnel can obtain it through their individual department managers.

Each NICTD department has specific safety responsibilities under the adopted SSPP. The departments have individual safety plans and documents that constitute the components of the overall NICTD safety program as detailed in the SSPP. To comply with the SSPP, NICTD has written a maintenance standard plan for the mechanical department, a quality assurance manual for the track department, an operating rules manual for operating trains, a manual for the procurement of vehicles, and an emergency response program plan.

Although the SSPP requires such action, NICTD has not developed an accident or investigation team (or manual) for determining the probable causes of accidents or incidents or for administering corrective action following accidents or incidents. The NICTD human resources department conducts all nonderailment accident and incident investigations, and the transportation department investigates all derailments. Currently, corrective action is negotiated on-scene. A fully implemented SSPP would include a means of determining the probable causes of accidents and incidents and of providing corrective action.

Despite the fact that several NICTD managers have stated that the SSPP has been implemented, the consensus of those NICTD personnel providing comments to the Safety Board is that the SSPP has not yet become a well-known and accepted element of the NICTD safety structure. The Safety Board concludes that, until its SSPP required by the FRA in Emergency Order No. 20 is fully implemented, some program-related safety benefits may not be realized by NICTD. Full implementation should include the familiarization of NICTD personnel at all organization levels with the goals, components, and expected results of the SSPP. Therefore, the Safety Board believes that NICTD should immediately and fully implement its SSPP, as required by the FRA under Emergency Order No. 20.

Director of Safety and Training

The NICTD SSPP's implementation is under the jurisdiction of the DST. The railroad established the DST position in March 1997 (after the FRA issued Emergency Order No. 20 in February 1997) to formalize NICTD's safety and training practices. NICTD had no safety officer before March 1997. The DST's office is physically located in Michigan City, Indiana, about 25 to 30 miles away from the GM's office in Ogden Dunes, Indiana.

As defined in the SSPP, the DST has specific authority to conduct scheduled and unscheduled inspections aimed at identifying hazards and unsafe practices, operations, and conditions. The DST may halt unsafe activities or operations that present an immediate and serious hazard within the system. The DST reports safety conditions that require remedial action to the appropriate department head, the chief operating officer, the manager of human resources, and the GM. The DST also coordinates safety training with department heads and ensures that safety rules are observed and enforced.

Additional DST responsibilities include:

- Assisting in the investigation of accidents and injuries to passengers and employees that may involve safety considerations;
- Working with department heads to develop ongoing safety training programs that are directly related to each department;
- Evaluating current safety rules and making recommendations to the chief operating officer and/or the GM for changes or additions to safety rules;
- Conducting appropriate reviews, audits, inspections, and analysis involving safety, health, and environmental issues;
- Assisting in human resource activities that relate to safety or training issues;
- Keeping current on all new or modified FRA and Occupational Safety and Health Administration (OSHA) rules and regulations, and conveying the information to appropriate authorities; and
- Ensuring that any new or revised regulations are implemented as they relate to safety or training.

The DST told investigators that he had been an assistant superintendent before assuming the role of DST and that he had received no specialized training on how to structure and implement a safety program either before or after assuming this post. The DST further stated that he had never met with NICTD's board of trustees, nor had he ever briefed them about the duties and responsibilities of the DST position.

The Safety Board has long advocated that transportation personnel be adequately trained to fulfill their job responsibilities. In particular, the person responsible for building, shaping, and managing the organization's safety system must be fully qualified to perform this duty. The DST had no experience in safety assurance before being selected for this position. He was unfamiliar with SSPPs and their functions. He was largely unaware of the vital role a DST plays in an organization. The Safety Board concludes that NICTD did not adequately prepare and train its DST to fulfill the responsibilities of the position.

Because the SSPP forms the basis of the NICTD safety program, the most efficient means of preparing the DST to fulfill the responsibilities of his position would be to train him in the functions and implementation of SSPPs. Therefore, the Safety Board believes that NICTD should provide any individual holding the office of DST with appropriate

training, including instruction on the functions, development, and implementation of SSPPs.

As shown in the NICTD organizational chart (see figure 2), the DST reports to the human resources manager and not the GM. The GM said that this is a "good technique," since the human resources department is responsible for safety and the coordination of personnel activities. The DST said that the fact that his position is not at the department-head level has not proven to be an obstacle, and he further stated that if he had a problem, he would not hesitate to contact the GM.

For years, the Safety Board has stated that the lead safety officer of any transportation organization should be situated at the highest managerial level within the organization. The Safety Board Chairman underscored this position during the April 24, 1997, corporate culture symposium held by the Safety Board, when he stated (in reference to the organization of an urban transit system):

> **A new director of safety will be joining** [the organization]**, and he will be reporting directly to the general manager. This is an organizational structure we have been recommending for years**… and is particularly evident among the major airlines. [Emphasis added.]

In its report on a derailment that took place in Kelso, California, in 1997, the Safety Board expressed its belief that the lead safety officer in a rail management structure should report directly to the primary managerial authority, in part, to avoid possible conflicts of interest between business operations and safety.[33] The Board noted that making the safety officer subordinate to the operating officer implies that safety may be secondary to operations. On February 25, 1998, the Safety Board recommended that the Union Pacific Railroad:

> R-98-16
>
> Review the functions and responsibilities of the Union Pacific Railroad general director of safety and make any organizational changes necessary to ensure that this official: (1) reports directly to the Union Pacific Railroad president and chief operating officer; (2) is involved in all Union Pacific Railroad operational issues that could affect train, railroad, and personnel safety and; (3) has the authority to take effective safety actions throughout the Union Pacific Railroad.

The Union Pacific Railroad did not concur with the recommendation. On April 5, 1999, the Safety Board classified the recommendation "Open—Unacceptable Response."

In the case of NICTD, reorganizing the management structure so that the DST reports directly to the GM would allow the DST to provide prompt input concerning management policies and practices that might not sufficiently address safety issues. In

[33] National Transportation Safety Board, *Derailment of Union Pacific Railroad Freight Train 6205 West Near Kelso, California, January 12, 1997*, Railroad Accident Report NTSB/RAR-98/01 (Washington, D.C.: National Transportation Safety Board, 1998), *p. 30.*

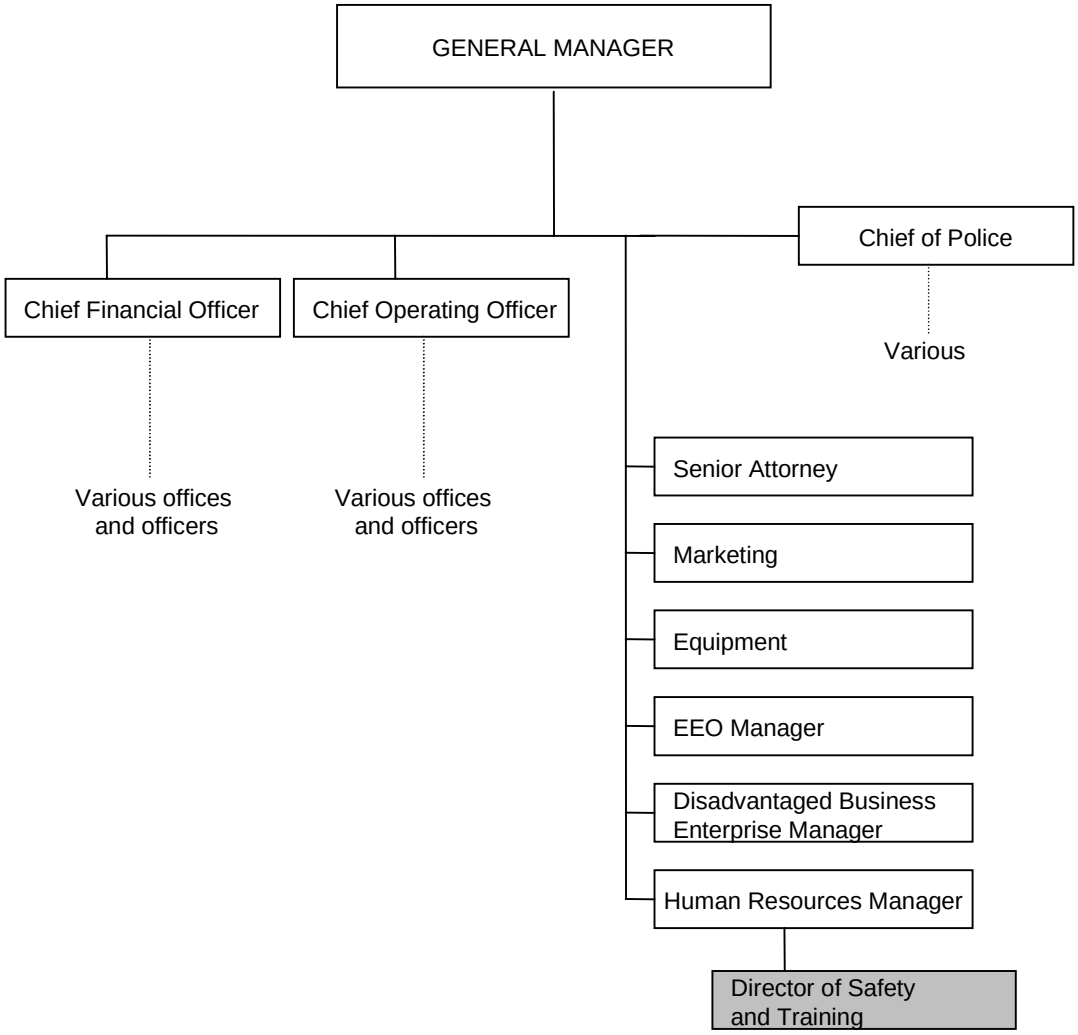

Figure 2. Selected elements of NICTD organizational chart, indicating the position of the director of safety and training

addition, important safety information could be communicated more reliably, avoiding the potential for miscommunication should the DST's information be misinterpreted by the department head in reporting to the GM or, conversely, should the GM's messages to the DST be misconstrued by the department head. Finally, placing the DST at the department-head level would send an unambiguous message to employees, customers, and the public that NICTD considers safety a high priority that encompasses and permeates all aspects of the organization. Therefore, the Safety Board concludes that the efficiency of safety information communication would be enhanced and the profile of safety would be heightened within the NICTD organization if the DST reported directly to the GM. The Safety Board believes that NICTD should elevate the position of DST to the department-head level and require that the DST report directly to the GM.

Emergency Response Programs

The NICTD emergency response plan details potential emergency scenarios, as well as standard procedures necessary to manage each situation. The document also stresses the importance of communication during an emergency and provides NICTD procedural guidelines and a directory listing various phone numbers and addresses of police, fire, and rescue agencies. The plan lists approved procedures for NICTD dispatchers and train crews to follow in the event of an emergency and outlines actions for responding to an emergency, as well as procedures for establishing an emergency response team. As part of its SSPP, NICTD has submitted its emergency response plan to the FRA.

Before drafting its FRA-mandated SSPP, NICTD had written an emergency response manual entitled *Passenger Train Emergency Preparedness*. The manual was included in the SSPP to comply with FRA requirements.

Since 1996, NICTD has conducted four emergency response drills: two drills simulated a collision between a passenger train and a freight train, one involved a passenger train traveling through fumes released from a tank car stopped at a siding, and the fourth simulated a passenger car derailing upright. Various agencies, including local hospitals, emergency medical services, ambulance services, the American Red Cross, police departments, fire departments, hazardous materials response units, and freight services, participated in the mock disaster drills.

Trains involved in accidents and incidents on Metra tracks are governed by the *Metra Emergency Preparedness Plan*. NICTD's operation from Kensington Avenue to Randolph Street in Chicago is on the Metra Electric District Line. NICTD trains are handled by the Metra Randolph Control/Dispatch Center when they are in that territory. NICTD supervisors are trained by Metra through "Train the Trainer" programs. NICTD supervisors train NICTD on-board personnel in the Metra plan. Emergency response test records are kept in the office of the NICTD DST in Michigan City, Indiana. NICTD told the Safety Board that it plans to conduct an emergency response drill with Metra of Chicago on their jointly operated tracks.

When interviewed by Safety Board investigators, NICTD managers expressed concern about conducting emergency responses in areas with limited accessibility, such as

regions with large waterways or swampy conditions. The NICTD system includes a number of bridges over waterways and significant areas of marshy land. The Safety Board has found in previous investigations[34] that when accidents take place in less accessible areas, emergency rescue procedures become both more difficult and more crucial. Therefore, the Safety Board concludes that safety would be enhanced if greater efforts were made to prepare local response agencies to deal with commuter train accidents in areas that are geographically difficult to access. The Safety Board believes that NICTD should develop training procedures and drills, in conjunction with local emergency response agencies, that address conducting emergency responses in all types of geographical conditions.

NICTD Corporate Safety Culture

Corporate safety culture is an organization's set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimizing the exposure of employees, customers, and members of the public to conditions considered dangerous or injurious.[35] During this investigation, the Safety Board attempted to determine the nature of NICTD's safety culture. To that end, Safety Board personnel interviewed the NICTD GM and members of his staff, as well as 16 employees from various departments. In addition, the investigators examined and evaluated NICTD safety documents and the organization's safety procedures and processes.

General

Some NICTD employees said that the organization routinely held safety meetings by department and that, in general, safety had improved over the past several years. Some employees also said that work areas were inspected for safety hazards about once a month. One employee commented that communications within the organization had improved in recent years, while another stated that the information flow was good. An employee told investigators that the resolution of safety concerns had improved and that safety had been enhanced in the last year.

Several employees interviewed by the Safety Board said that safety could be improved. Specifically, one employee said that NICTD lacked a formal training program; another said that the entire safety program was not very effective and required work. Still another said that the DST needed a staff to be able to address safety adequately.

The NICTD chief operating officer said that NICTD had experienced the "realization of fatalities" and that safety was paramount. When asked about NICTD's safety culture, the DST said that a strong safety culture was something the organization

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[34] National Transportation Safety Board, *Derailment of Amtrak Train No. 2 on the CSXT Big Bayou Canot Bridge Near Mobile, Alabama, September 22, 1993,* Railroad-Marine Accident Report NTSB/RAR-94/01 (Washington, D.C.: National Transportation Safety Board, 1994).

[35] B.A. Turner, N.F. Pidgeon, D.I. Blockley, and B. Toft, *Position Paper for the Second World Bank Workshop on Safety Control and Risk Management, November 6-9, 1989, "Safety Culture: Its Importance in Future Risk Management"* (World Bank: Karlstad, 1989).

endorsed and practiced. Both managers expressed particular concern about grade-crossing safety.

The NICTD GM told investigators that each department within NICTD was responsible for convening safety meetings (the frequency of meetings varied by department) during which employees could raise safety concerns. The NICTD chief operating officer said that while employees may have been reprimanded for failing to follow safety rules, no NICTD employee had ever been reprimanded for identifying a safety concern. The DST stated that NICTD had no safety hotline or other mechanism by which employees could anonymously bring safety concerns to management attention, but he said that employees had occasionally requested that he investigate a safety concern and not identify them as the source of the complaint.

Concerning the communication of safety information within the organization, the DST said that NICTD disseminated weekly safety notices and that personnel with operating, engineering, and mechanical responsibilities were required to read general (operational) notices. With regard to the means of identifying safety-related information to be provided to employees, he said that an employee monitored the *Federal Register* for information, that the railroad subscribed to several OSHA safety letters, and that he had contacts within the industry with whom he exchanged safety information.

The DST also said that every NICTD department had a safety committee and that NICTD had an organization-wide safety committee composed of seven members—two from the mechanical department and one each from the transportation, track, line and signal, buildings and bridges, and accounting departments—representing the main NICTD operational areas. Each departmental safety committee focused on those safety concerns specific to that department, while the NICTD safety committee dealt with NICTD-wide safety issues.

In response to a questionnaire that investigators asked him to complete, the DST reported that NICTD sometimes held safety meetings and that meeting attendance was documented. The DST also noted that since the Portage accident, he has been developing individual safety and training files for each NICTD employee.

Safety Documents

The Safety Board examined two NICTD safety publications, the *NICTD Rules of Safety* and the *Chicago SouthShore and South Bend Railroad and Northern Indiana Commuter Transportation District, Rules and Regulations for the Government of the Operating Department*.

The *NICTD Rules of Safety* is a 91-page, pocket-sized handbook that NICTD provides to each NICTD employee. It covers hundreds of rules that concern safety in every aspect of NICTD activity, from personal protective equipment to office practices. The handbook is in loose-leaf format, so that pages can be removed and replaced as NICTD updates safety procedures. On its first page, the handbook states

> Safety is **every employee's** primary responsibility. [Emphasis appears in original.]
>
> Accident prevention is the primary goal and benefit of a successful safety program. Conditions and procedures must be constantly monitored and evaluated by all employees to improve safety conditions.
>
> This revised Safety Rule Book establishes the minimum mandatory guidelines that must be followed to prevent injury and property damage. Your vigilance and judgment are vital to accident prevention.

The *Chicago SouthShore and South Bend Railroad and Northern Indiana Commuter Transportation District, Rules and Regulations for the Government of the Operating Department* is a document of about 170 pages, and it covers the operational procedures necessary to NICTD's activities. A "General Notice" on the second page of the book states (in part)

> **Safety** is of the first importance in the discharge of duty. In case of doubt, adopt the safe course. Speed must always be sacrificed for safety. Obedience to the rules is essential to safety and is required. [Emphasis appears in original.]

While some NICTD employees stated that the organization could improve safety, the Safety Board's investigation did not reveal any instances of blatant disregard for safety concerns. The fact that the various departments within NICTD convene safety meetings during which unsafe conditions and practices are identified and addressed shows that NICTD has developed a systematic means of publicizing and resolving workplace safety issues. Furthermore, consistent with the views of many safety professionals, who contend that management is responsible for the practices, customs, and attitudes that relate to safe operations, NICTD managers have shown by their testimony and actions that they are aware they must set the tone for safety by policy and example. In addition, NICTD has provided its employees exhaustive written guidelines that stress the importance of safety to the organization. Therefore, the Safety Board concludes that NICTD's corporate culture generally encourages safety awareness in rail operations.

Summary

In its special investigation, the Safety Board examined the safety aspects of NICTD's accident history and safety record, infrastructure and operating practices, internal safety programs, and corporate safety culture. With respect to the particular issues reviewed, the Safety Board's investigation found that NICTD's operating practices generally adhere to accepted safety principles, NICTD has an established system of internal safety programs, and NICTD's corporate culture generally encourages safe employee behavior. Nevertheless, the investigation indicated that NICTD has problems, which NICTD recognizes and is attempting to address, regarding the serious issue of grade-crossing safety. To enhance NICTD's safety practices, the Safety Board urges NICTD to adopt the recommendations made in this report regarding grade-crossing safety, signal upgrading, SSPP implementation, emergency response drills, and the role of the DST within the organization.

The Safety Board emphasizes that these selected factors do not represent the full range of conditions that may affect an organization's safety. The Board also notes that, until the NICTD SSPP is fully implemented, significant elements will be absent from the NICTD safety system. Therefore, the Safety Board concludes that, in addition to the specific areas in which the Safety Board recommends that NICTD take action to improve safety, other safety-enhancement opportunities may remain for NICTD to pursue.

In particular, the Safety Board is anxious that NICTD take steps to ensure that the implementation of its SSPP results in the production and maintenance of a NICTD safety program that is comprehensive and as effective as possible. The Safety Board therefore believes that NICTD should engage an independent safety auditing organization to conduct a comprehensive safety audit of NICTD operations.

Conclusions

1. The Northern Indiana Commuter Transportation District does not appear to have significant deficiencies in its track maintenance program.

2. The Northern Indiana Commuter Transportation District has followed standard engineering practice in contracting structural engineering expertise for evaluating, inspecting, and load-rating its older bridges and has implemented measures to maintain the structures for the safe passage of expected train traffic.

3. The Northern Indiana Commuter Transportation District appears to be effectively implementing and administering its signal inspection program.

4. The Northern Indiana Commuter Transportation District's failure to complete the elimination of AC line circuits and conversion to DC line circuits on its signal system may have reduced the system's safety.

5. The lack of adequate signage and advance warning devices at some Northern Indiana Commuter Transportation District passive grade crossings poses a risk to system customers and motorists.

6. Despite the Northern Indiana Commuter Transportation District near-miss program to educate motorists who violate highway-rail grade crossings, significant numbers of highway-rail grade-crossing violations continue on the Northern Indiana Commuter Transportation District system.

7. Making grade-crossing signal lights more conspicuous would provide more effective warning and additional stopping time for motorists approaching grade crossings.

8. Until the Northern Indiana Commuter Transportation District System Safety Program Plan, required by the Federal Railroad Administration in Emergency Order No. 20, dated February 20, 1996, is fully implemented, some program-related safety benefits may not be realized by the Northern Indiana Commuter Transportation District.

9. The Northern Indiana Commuter Transportation District did not adequately prepare and train its director of safety and training to fulfill the responsibilities of the position.

10. The efficiency of safety information communication would be enhanced and the profile of safety would be heightened within the Northern Indiana Commuter Transportation District organization if the director of safety and training reported directly to the general manager.

11. Safety would be enhanced if greater efforts were made to prepare local response agencies to deal with commuter train accidents in areas that are geographically difficult to access.

12. The Northern Indiana Commuter Transportation District's corporate culture generally encourages safety awareness in rail operations.

13. In addition to the specific areas in which the National Transportation Safety Board recommends that the Northern Indiana Commuter Transportation District take action to improve safety, other safety-enhancement opportunities may remain for the Northern Indiana Commuter Transportation District to pursue.

Recommendations

As a result of this special investigation, the National Transportation Safety Board makes the following safety recommendations:

to the Northern Indiana Commuter Transportation District:

Work with the U.S. Department of Transportation and the Indiana Department of Transportation to develop and implement a strategic plan to improve safety at Northern Indiana Commuter Transportation District highway-rail grade crossings. (R-99-37)

Work with the Indiana Department of Transportation and Indiana's Lake, Porter, LaPorte, and St. Joseph Counties to install stop signs at all your passive grade crossings, unless a traffic engineering analysis determines that installation of stop signs would reduce the safety of the crossing. Any Northern Indiana Commuter Transportation District crossings at which conditions are such that the installation of stop signs would reduce the level of safety should be upgraded with active warning devices or eliminated. (R-99-38)

Immediately and fully implement your System Safety Program Plan, as required by the Federal Railroad Administration under Emergency Order No. 20, dated February 20, 1996. (R-99-39)

Provide any individual holding the office of director of safety and training with appropriate training, including instruction on the functions, development, and implementation of System Safety Program Plans. (R-99-40)

Elevate the position of director of safety and training to the department-head level and require that the director of safety and training report directly to the general manager. (R-99-41)

Complete the conversion or elimination of signal control line circuits within 2 years. (R-99-42)

Revise your near-miss program to provide closure with individuals reporting violations. (R-99-43)

Develop training procedures and drills, in conjunction with local emergency response agencies, that address conducting emergency responses in all types of geographical conditions. (R-99-44)

Engage an independent safety auditing organization to conduct a comprehensive safety audit of Northern Indiana Commuter Transportation District operations. (R-99-45)

to the Indiana Department of Transportation:

Work with the U.S. Department of Transportation and the Northern Indiana Commuter Transportation District to develop and implement a strategic plan to improve safety at Northern Indiana Commuter Transportation District highway-rail grade crossings. (R-99-46)

Assist the Northern Indiana Commuter Transportation District in upgrading all 8-inch crossing signal light units on its territory. (R-99-47)

Work with the Northern Indiana Commuter Transportation District and Indiana's Lake, Porter, LaPorte, and St. Joseph Counties to install stop signs at all Northern Indiana Commuter Transportation District passive grade crossings, unless a traffic engineering analysis determines that installation of stop signs would reduce the safety of the crossing. Any Northern Indiana Commuter Transportation District crossings at which conditions are such that the installation of stop signs would reduce the level of safety should be upgraded with active warning devices or eliminated. (R-99-48)

to the Lake County, Indiana, Board of Commissioners:

Work with the Northern Indiana Commuter Transportation District and the Indiana Department of Transportation to install stop signs at all Northern Indiana Commuter Transportation District passive grade crossings in your county, unless a traffic engineering analysis determines that installation of stop signs would reduce the safety of the crossing. Any Northern Indiana Commuter Transportation District crossings at which conditions are such that the installation of stop signs would reduce the level of safety should be upgraded with active warning devices or eliminated. (R-99-49)

to the Porter County, Indiana, Board of Commissioners:

Work with the Northern Indiana Commuter Transportation District and the Indiana Department of Transportation to install stop signs at all Northern Indiana Commuter Transportation District passive grade crossings in your county, unless a traffic engineering analysis determines that installation of stop signs would reduce the safety of the crossing. Any Northern Indiana Commuter Transportation District crossings at which conditions are such that the installation of stop signs would reduce the level of safety should be upgraded with active warning devices or eliminated. (R-99-50)

to the LaPorte County, Indiana, Board of Commissioners:

Work with the Northern Indiana Commuter Transportation District and the Indiana Department of Transportation to install stop signs at all Northern Indiana Commuter Transportation District passive grade crossings in your county, unless a traffic engineering analysis determines that installation of stop signs would reduce the safety of the crossing. Any Northern Indiana Commuter Transportation District crossings at which conditions are such

that the installation of stop signs would reduce the level of safety should be upgraded with active warning devices or eliminated. (R-99-51)

to the St. Joseph County, Indiana, Board of Commissioners:

Work with the Northern Indiana Commuter Transportation District and the Indiana Department of Transportation to install stop signs at all Northern Indiana Commuter Transportation District passive grade crossings in your county, unless a traffic engineering analysis determines that installation of stop signs would reduce the safety of the crossing. Any Northern Indiana Commuter Transportation District crossings at which conditions are such that the installation of stop signs would reduce the level of safety should be upgraded with active warning devices or eliminated. (R-99-52)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

JAMES E. HALL
Chairman

JOHN A. HAMMERSCHMIDT
Member

ROBERT T. FRANCIS II
Vice Chairman

JOHN J. GOGLIA
Member

GEORGE W. BLACK, JR.
Member

Adopted: August 10, 1999

Appendix A

Letter from Senator Richard Lugar and Congressman Peter J. Visclosky

06/18/98 THU 18:00 FAX 202 225 2493 MC980795 002

Congress of the United States
Washington, DC 20515

June 18, 1998

Mr. Jim Hall
Chairman
National Transportation Safety Board
490 L'Enfant Plaza East, S.W.
Washington, D.C. 20594

Dear Chairman Hall:

Today, we were notified that the National Transportation Safety Board (NTSB) is sending a full go-team to investigate the tragic grade crossing accident that occurred this morning in Portage, Indiana on the Chicago South Shore and South Bend Railroad, which is operated by the Northern Indiana Commuter Transportation District (NICTD). Initial reports are that three passengers were killed in this accident.

This is not the first tragic accident experienced by NICTD. In 1993, seven passengers were killed, and 95 people injured, in a collision between two NICTD commuter trains. In 1985, another collision resulted in 87 injuries. Both of these accidents occurred in Gary, Indiana and were the subject of major reports by the NTSB. In addition, last year, a woman was killed when she fell onto the South Shore Railroad tracks at the Chicago station.

Given these recent accidents and fatalities, we want to ensure the long-term safe operation of the entire South Shore line. Many residents of Northern Indiana rely on the South Shore Railroad to commute to and from jobs in Chicago. These people are entitled to safe and efficient transportation. Therefore, we request that the Safety Board use its authority and resources to conduct a special investigation to assess the overall safety of the NICTD commuter rail operation.

We understand that a full investigation into the cause of this latest accident will be conducted by the NTSB and we do no want this request to interfere with the timely completion of the Portage investigation. However, we feel strongly that a safety assessment by the NTSB of the entire NICTD commuter rail operation is necessary to identify and correct any existing safety problems and to restore confidence in this vital transportation system.

Thank you for your prompt response to the accident today, and for your serious consideration of our request. Do not hesitate to let one of us know if you need any additional information.

Sincerely,

Richard Lugar
United States Senator

Peter J. Visclosky
Member of Congress

Appendix B

Data on Federal Railroad Administration Inspections of NICTD

(Note: The FRA database changed in 1995.)

Table 1. FRA inspections of NICTD

Year	Motive Power and Equipment	Operations	Signal	Track	TOTAL
1998	5	16	4	10	35
1997	6	90	6	16	118
1996	13	80	7	1	101
1995	13	5	8	9	35
1994	7	32	27	8	74
1993	10	46	10	14	80

Table 2. FRA violations reported for NICTD

Year	Motive Power and Equipment	Operations	Signal	Track	TOTAL
1998	0	0	0	0	0
1997	0	0	0	0	0
1996	1	0	0	2	3
1995	0	0	0	0	0
1994	0	0	0	0	0
1993	0	0	2	0	2

Table 3. FRA defects found for NICTD

Year	Motive Power and Equipment	Operations	Signal	Track	TOTAL
1998	0	1	2	1	4
1997	1	3	5	0	9
1996	10	12	15	2	39
1995	49	3	18	18	88
1994	14	5	11	53	83
1993	17	22	100	29	168

Acronyms and Abbreviations

ABS	automatic block signal
APTA	American Public Transit Association
CFR	*Code of Federal Regulations*
Conrail	Consolidated Rail Corporation
CSS	Chicago SouthShore and South Bend Railroad
DST	NICTD director of safety and training
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GM	NICTD general manager
GXIR	*Highway-Rail Grade Crossing Accident/Incident Report*
ICC	Illinois Commerce Commission
INDOT	Indiana Department of Transportation
LCV	long combination vehicle
LED	Light Emitting Diode
Metra	Chicago Northeast Illinois Regional Commuter Rail Corporation
NICTD	Northern Indiana Commuter Transportation District
OSHA	Occupational Safety and Health Administration
PTS	INDOT Public Transportation Section
RAIR	*Rail Equipment Accident/Incident Report*
SACP	Safety Assurance and Compliance Program
SSPP	System Safety Program Plan