

The National Passenger Railroad Corporation (Amtrak) respectfully submits the following proposed findings and recommendations with regard to the December 18, 2017 derailment in DuPont, Washington.

We appreciate the assistance, cooperation and guidance of the National Transportation Safety Board (NTSB) throughout the investigative process and for the opportunity to participate as a party to the investigation.

### **Incident summary**

On December 18, 2017, at approximately 7:33 a.m., PST, southbound National Railroad Passenger Corporation (Amtrak) train 501, derailed in a curve at milepost (MP) 19.86 on the Lakewood Subdivision near DuPont, Washington. The lead locomotive, the power car, and two passenger coaches derailed onto Interstate 5. The train was on its first revenue service run on the Pt Defiance Bypass, a single main track from Tacoma, when it derailed. The authorized track speed in the area of the accident was 79-mph on approach to the 30-mph curve just before the bridge. A speed board (sign) was located about 2-miles before the curve. Positive Train Control (PTC) was not in service on the line the train was operating on.

As a result of the derailment, three passengers were fatally injured. At least 62 passengers and crewmembers of the Amtrak train were transported to medical facilities. Eight occupants of highway vehicles also sustained injuries.

Service on the Lakewood subdivision was a centralized traffic control system with wayside signals. Signal indications authorized movement in either direction. At the time of the incident. PTC was not active. Sound Transit, the track owner and host of Amtrak operations, was installing PTC in the area.

Amtrak served as a party to the NTSB investigation assisting in the inspection of the track structure, signal system, and mechanical equipment along with participating in interviews and record reviews.

NTSB held an Investigative Hearing on July 10-11 2018 during which, Amtrak provided testimony pertaining to passenger safety, detailed the actions taken in response to recent accidents and provided an update on the progress of our Safety Management System (SMS) implementation. This submission details additional progress made since the hearing.

### **Amtrak Response**

Amtrak employees responded to the scene of the incident to assist in the response and recovery efforts as well as supporting the NTSB and Federal Railroad Administration (FRA) investigations. Amtrak activated the Family Assistance Center to address needs of families of passengers involved in the accident. Amtrak sincerely regrets the tragic loss of life of three of our customers as well as the injuries suffered by our customers and employees in the DuPont, Washington derailment.

## **Background**

The area in which the incident occurred is the Lakewood Subdivision, a 21.3 mile segment of main line owned and maintained by Sound Transit extending from TR Junction (MP 0.7) in Tacoma to BNSF's Nisqually Junction (MP 21.3). Operations on the subdivision are controlled by the Burlington Northern Santa Fe Railroad (BNSF) Centralia North dispatcher. The method of operations is under a Centralized Traffic Control (CTC) which authorizes train movements by signal indication. A Positive Train Control (PTC) system was not operational on the Lakewood Subdivision at the time of the incident, as Sound Transit was planning to install the system after the initiation of service on the subdivision.

Amtrak conducted test runs with Talgo tilting cars to establish the performance of high cant deficiency operation in 1988. In 1994, Amtrak began a six-month trial run of Talgo equipment over the Seattle–Portland corridor in collaboration with Washington State Department of Transportation (WSDOT). In 1996, WSDOT and Amtrak placed an order to buy three Talgo Series VI trainsets (two owned by WSDOT and one owned by Amtrak). Amtrak subsequently purchased an additional trainset. The trainsets were placed into service in 1998 and are operated by Amtrak under the Cascades® brand name. WSDOT acquired a fifth Series VI trainset in 2003. The state of Oregon purchased two Series 8 trainsets in 2010 which were placed into service in 2013.

Since the inception of service, the Cascades route has grown in ridership and revenue resulting in a demand for additional train frequencies. Planned expansions to provide additional service led to the project to upgrade the Pt. Defiance Bypass route which would enable additional service options. Amtrak local management participated in a limited number of meetings dedicated to the initiation of service and relied upon the leadership of the host railroad regarding the safety certification for revenue service.

## **Post Incident Actions Undertaken**

After the Train 501 accident, Amtrak again focused on how to improve safety for our customers and employees. We have concluded that we must not rely on the operating conditions of a host and must instead augment our hosts' operating practices in ways that meaningfully enhance the safety of our passenger operations.

As noted in prior submissions and correspondence to NTSB, Amtrak had been working toward the development of an SMS before the April 3, 2016 accident in Chester, PA involving Amtrak MOW equipment and Train 89<sup>1</sup>, and our efforts took on increased emphasis following recent accidents. In addition to the staffing and organizational alignments detailed in testimony provided by Amtrak officials at the investigative hearing, Amtrak's board of directors passed a resolution requiring the implementation of an SMS and Positive Train Control (PTC) in March of 2018. This resolution served as a catalyst to accelerate recent efforts to operationalize safety processes. This effort initiated the development and implementation of a safety strategy for 2019 which was approved by the board of directors in September 2018.

Amtrak is aggressively implementing processes for risk reduction and driving cultural change through data-driven decision making. We have undertaken multi-departmental root cause and corrective action

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<sup>1</sup> NTSB Accident ID DCA16FR007

initiatives through collaborative teams comprised of both non-agreement and agreement personnel evaluating critical operational risk exposures. We have worked to improve and expand our safety processes with host railroads. Amtrak has initiated a number of joint risk assessment and risk reduction activities with host railroads and tenants in areas which Amtrak functions as a host. We are applying our risk assessment processes and making safety driven decisions to the proposed establishment of new routes, the continued operation of our trains in Non-PTC territory, analysis of train operating data from the PTC system and changes to the system which may have an impact on safety. We are working to reinvigorate our safety committees and, through the continued application of risk management tools under the guidance of the System Safety Department, beginning to task these groups with risk reduction throughout the Amtrak system.

In 2018, we identified and prioritized a number of focus areas in which we are working to develop our SMS. These focus areas include Safety Policy, Risk-based Hazard Management, Data Acquisition and Analysis, Safety Assurance, Voluntary Safety Reporting, and Accident/ Incident Investigation. Amtrak understands that successful implementation of a safety management system is never complete; a critical element of the system is continuous improvement. As of the date of this submission, Amtrak has issued a new safety policy, endorsed by the executive leadership team to all employees. We have created new safety metrics which combine lagging and leading indicators to monitor the performance of our safety programs. These metrics are communicated throughout the organization and progress toward the achievement of goals is monitored at multiple levels of the company. We have implemented a Voluntary Safety Program with our engineering labor organizations and are continuing to improve our corrective actions through robust and collaborative accident/incident investigations. Amtrak has also reinvigorated our participation in the Confidential Close Call Reporting Systems (C3RS) by increasing the frequency of peer review team meetings and clearing a backlog of reports. Amtrak has also recognized the need for dedicated resources to oversee the program and has created a role within the System Safety department to facilitate and manage the Voluntary Safety Reporting Programs for the company.

Amtrak's SMS implementation will require the support provided by our labor leaders and the familiarity of our field personnel. While being mindful of the central importance of standardized procedures and rule adherence, we also know that our employees' working relationships with the hosts' field personnel, dispatchers, and maintenance forces enrich their situational awareness, providing vital insights that we must weave into our safety program to make it as comprehensive and effective as possible. We are actively partnering with our labor leaders throughout the implementation of the Safety Management System and have engaged their participation in the safety certification program for the Pt. Defiance Bypass.

As we move through 2019, we are expanding our risk management program to include a formalized program of assessments focused on identification of opportunities to improve station and grade crossing safety. We are continuing to invest in systems to improve employee training by re-designing safety critical course content and expanding the use of simulation in training. We are working to enable the acquisition of safety data to enhance the analytical capabilities of the organization in partnership with the Information Technology department by procuring new Safety Management Software. We are launching an internal evaluation program to assess critical safety processes and continuing the expansion of voluntary safety reporting programs. We are executing all of these activities against the backdrop of a paradigm shift toward implementing a Just Culture where we become a learning organization.

Amtrak has made progress in the implementation of Just Culture principles throughout the organization. We recognize that the establishment of a Just Culture is more than a safety effort and have engaged all facets of the corporation in a review of company policies and actions that contribute to the cultural perceptions of fairness, which are critical in the establishment of a learning organization. Amtrak has partnered with a subject matter expert in the use of Just Culture in decision making. We have held multiple educational sessions with labor and management to begin the implementation of cultural change.

Amtrak recognizes the need for our leadership in the execution of the change-management process to assure safety of operations. We will take a lead role in the integration of efforts for all service we provide. We have put in place a series of new processes based upon lessons learned from this accident to ensure effective facilitation between parties in all service areas. With regard to the implementation of a Safety Management System, Amtrak has written a System Safety Program Plan (SSPP) and submitted the plan to the FRA in November of 2018. This plan includes a requirement for new service to undergo a robust safety certification process. This process includes a holistic evaluation of the service characteristics, risk assessment activities and a revised and expanded employee training and qualification process.

Amtrak has worked with Sound Transit to implement a graduated speed reduction in advance of the curve upon which train 501 derailed. This speed reduction will enhance safety through the inclusion of additional speed signs in advance of the curve location. This will eliminate a speed change of greater than 20 MPH and will enhance safety by lengthening the transition into the curve. Additionally, Amtrak has worked with Sound Transit to include a focus zone in the area of the curve which aligns with other critical curve locations.

With regard to employee training and qualification, Amtrak has developed a strategic plan to maximize the use of simulators in training, qualification, and certification of Amtrak employees, while reducing impact to revenue operations. Amtrak is upgrading the simulator programs to include route specific details and conditions in varying times of day. This substantial increase in the fidelity of simulation routes will enhance the availability of training opportunities in a controlled environment allowing crews to increase familiarity with the route prior to operations. These efforts have culminated in the adoption of a new Engineer Route Qualification protocol that governs how crews will be trained and evaluated on new territory. The type and amount of training required, including a minimum number of training runs performed in the company of a Designated Supervisor of Locomotive Engineers (DSLE), will reflect a careful risk assessment of the specific route in question. This assessment is overseen by the Compliance, Certification and Quality Assurance unit within the Safety, Compliance and Training organization.

In the case of the Pt. Defiance Bypass, the simulators have been upgraded with the route specific characteristics and the operation qualification program requirements include physical characteristic training, oral and written rules examinations and simulator assessments. Exam content is developed and approved by the office of the System General Road Foreman. In line with the aforementioned upgrades to the simulation program, Engineers will perform multiple runs in the territory in both daylight and nighttime conditions. After successful completion of the simulation program, engineers will operate a minimum of six round trips over the route with a qualified DSLE and receive a final round trip evaluation by a qualified DSLE. Conductors will be required to pass written and oral examinations in addition to completion of at least two head end observation trips and at least one observation trip in the body of the train.

Amtrak also recognizes an opportunity to enhance situational awareness of the train crew through technological means. Accordingly, Amtrak System Safety has partnered with the Amtrak's Information Technology and Track Geometry organizations to develop an application, entitled AWARE, that monitors the position and speed of a train in real-time and provides alerts via the conductor's eMD, a multi-purpose handheld device used to lift tickets and monitor delays to the train. The application sends a series of alerts requiring acknowledgement to the conductor of upcoming speed restrictions. This application utilizes five data streams including GPS data from the eMD to ensure accuracy of information and position in areas where cellular coverage is not consistent. Amtrak demonstrated a proof of concept in November 2018 and is working on a targeted deployment of the application on territory with a Positive Train Control Mainline Track Exclusion Addendum (MTEA) in 2019 with system-wide deployment to follow.

As part of the investigation, Amtrak appreciates the opportunity to participate in the working groups to develop the factual reports upon which this submission is based. Included amongst these reports are the NTSB evaluation of the crashworthiness of the Talgo Equipment. Based upon the report, Amtrak has engaged in dialog with the equipment manufacturer to review the behavior of the equipment involved in the accident with specific focus on survival factors of the equipment noted by NTSB.

Talgo has performed a system modification campaign to address seat rotation, has replaced rolling assembly retention straps and has installed HPPL decals throughout the trainsets. Additional campaigns to modify the emergency lighting and address power loss in the event of car separation are currently in the design phases.

Amtrak is advancing work with our state partners to address the long-term fleet requirements for Cascades service, as the existing Talgo Series VI trainset fleet ages. A confluence of factors including trainset performance, impending required trainset overhauls, Amtrak's overall fleet strategy and Cascades service requirements point to replacement of the Series VI sets as our preferred solution. Over the past five years, Amtrak has made significant steps towards a new fleet by purchasing new electric locomotives, a new generation of Acela Express trainsets, supplemental single level long distance equipment, and most recently new mainline diesel locomotive for our national network trains. To guide our long-term fleet efforts the company began developing a comprehensive fleet strategy to improve, replace and modernize Amtrak's fleet. Currently the company is engaged in an intercity single-level vehicle procurement and plans to complete this selection by the end of FY2019. Prior to delivery of new trains for Cascades service, Amtrak is pursuing the use of other existing Amtrak fleet to substitute for Series VI equipment when it becomes available.

In the interim, Amtrak believes that the operation of the Talgo Series VI equipment along the existing Cascades service route, an environment with full implementation of PTC, substantially reduces potential operational risks. The implementation of PTC prevents a train to train collision, operation through a misaligned switch, incursion into a work zone and protects against an overspeed derailment.

### **Proposed Findings**

1. Protections against overspeed derailment inherent in a Positive Train Control (PTC) system were inactive, as a planned infrastructure modification project in order to implement PTC was underway by Sound Transit.
2. Project oversight was fragmented and compartmentalized between and among WSDOT, Sound Transit and local Amtrak management.
3. Effective safety certification and oversight was hindered by the complexity of the array of invested parties in the initiation of service on the Pt. Defiance Bypass and the lack of involvement by Amtrak management beyond the local level.
4. Risk Assessments conducted by Sound Transit identified overspeed derailment risks in the area of the curve. The mitigation of PTC was identified but not required for initiation of service. No other mitigations were required by the host railroad.
5. Safety Certification Verification Activities conducted by Sound Transit before the initiation of service did not identify the absence of PTC as a risk requiring interim mitigation.
6. Amtrak physical characteristic training and route familiarization was restricted in terms of access to the tracks and the lack of a company standard route qualification protocols including the use of simulation.

### **Probable Cause**

The probable cause of the incident was the failure on the part of the Amtrak Locomotive Engineer to comply with posted speed restrictions in the area of MP 19.86.

### **Proposed Recommendations**

Amtrak respectfully submits the following proposed recommendations for NTSB consideration:

To Amtrak:

1. Continue and expand the use of Risk Assessment and Safety Certification Practices to identify, evaluate and mitigate hazards present before initiating revenue service and throughout the operational life cycle.
2. Continue and expand the use of simulation for locomotive engineer training.
3. Continue and expand the use of technological means to enhance situational awareness.
4. Continue the implementation of a Safety Management System.
5. Standardize the physical characteristics route qualification process

### **Conclusion**

Amtrak pledges to continue working collaboratively with internal resources and industry stakeholders to improve the safety of railroad operations. We wish to express our continued commitment to implementing a Safety Management System and look forward to the findings and recommendations of the National Transportation Safety Board.