



Positive Train Control

Meeting the Federal Mandate to Allow
Continued Passenger Operations on the Alaska Railroad

Quarterly Progress Report January 15, 2014



Northbound Denali Star passenger train meets the Southbound Freight at Willow. The freight is in Willow Siding, the Denali Star is on the Main Track, speed 60 mph.

**This report covers the period:
October 1, 2013 through December 31, 2013**



Positive Train Control

Project Summary

There is a federal mandate to install Positive Train Control (PTC), an enhanced safety system to eliminate human factor errors for train and roadway worker operations on all railroads carrying passengers, including the Alaska Railroad (ARRC). PTC is a research and development project and is extremely expensive.

PTC was mandated by Congress in 2008, but ARRC has been working since 1996 to develop a PTC system. ARRC is facing a deadline of December 31, 2015 to complete the implementation of PTC. ARRC and most railroads in the lower 48 will not meet the 2015 deadline. However, we expect that ARRC will continue to make progress towards PTC implementation and will be allowed to continue passenger operations as long as we make a good faith effort towards implementation. Our budget and plan are based on full implementation by 2018.

The PTC System must reliably prevent the following:

- Train to train collisions.
- Overspeed derailments and incidents.
- Work zone incursions.
- Improper movements over switches and control points.



ARRC export coal train climbing to Grandview. This area requires significant communications systems to support PTC.

The PTC System:

There are 5 major segments to the system:

- Office Systems: Several sophisticated computer systems authorize and monitor all railroad movements. These systems are still in development, integration and testing phases.
- Locomotive On Board Systems: Computers, data radios and global positioning system (GPS) equipment will be placed on every locomotive and interfaced with the locomotive controls. If a locomotive engineer fails to perform safely, this system will warn the engineer and then proceed to stop the train. Fifty-four ARRC locomotives and cab control cars will need this equipment.



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- Wayside Systems: Switches and signals will be monitored to ensure safe train movement. ARRC will have over 108 switches and 36 signal control points; each will need to communicate with every train or the PTC system will stop the train short of the switch or control point.



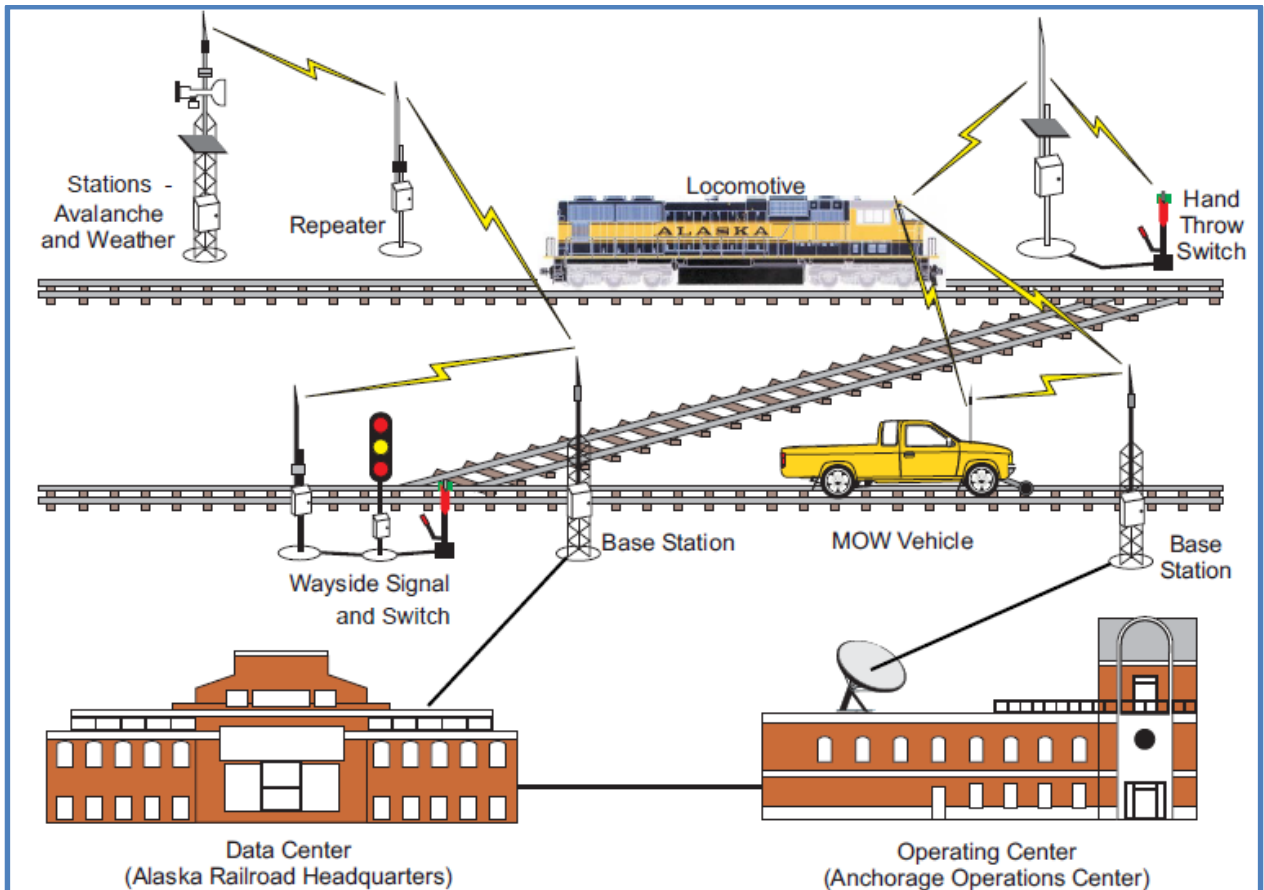
PTC wayside switch monitoring at Potter siding with antennas for GPS, train to wayside data radio, and office to field data radio. Note solar and wind power generation.

- Communications Systems: PTC requires an extensive, sophisticated communications network. A great deal of data must move over microwave and fiber backhaul networks and data radios between the Dispatch Office, the On-Board Systems, and the Wayside Systems.
- System Integration: All four segments are required to integrate in a fail-safe PTC system to eliminate human factor errors. Fail-safe means that if any human-factor failures are detected, the system will fail safely by sending a command to stop the train movements before an incident can occur. In addition to PTC operating in a fail-safe manner the system is mandated to be highly reliable.



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The following diagram illustrates the communication-based PTC system interacting with the various segments to allow for safe train movements and maintenance activities on the Alaska Railroad:

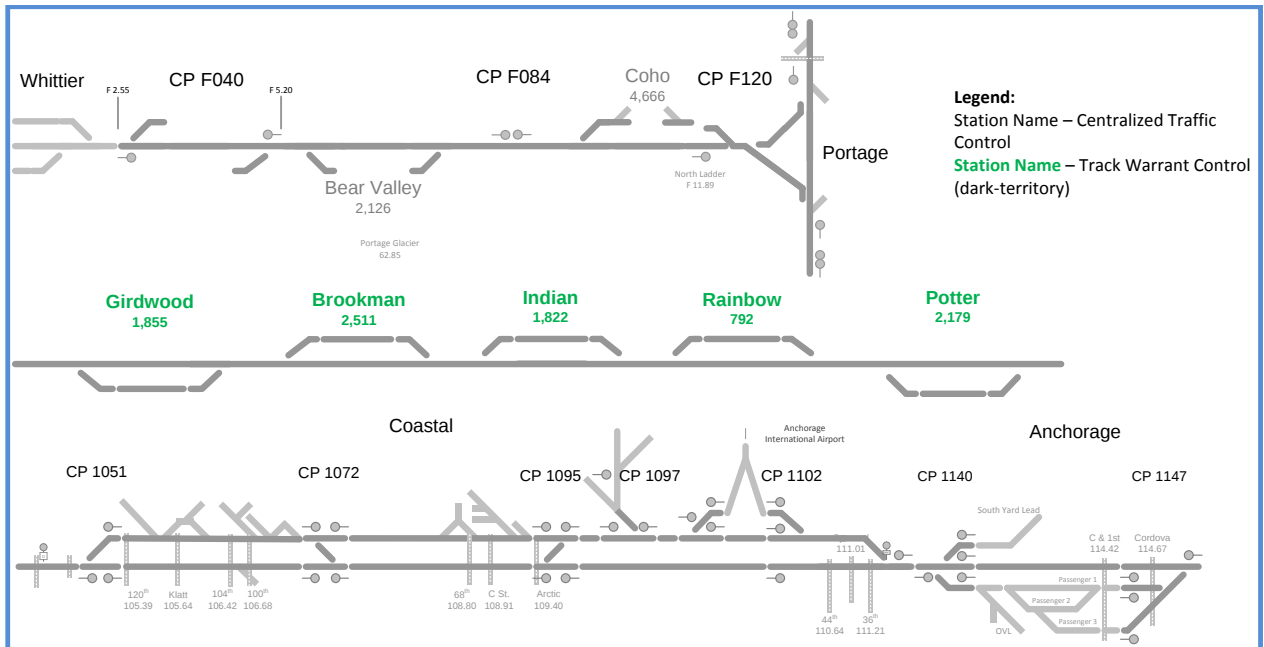


Implementation Strategy

ARRC is implementing a PTC equipped test corridor between Anchorage and Whittier. This will enable testing of the individual PTC system segments and progress to functional testing in a manageable area prior to full deployment for all trains and railroad wayside switches and signals. The test corridor is shown in the graphic below. The corridor is expected to be ready for testing in summer 2014.



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Alaska Railroad "Test Corridor" with wayside locations indicated.

Current Status - Quarter Ending December 31, 2013

- Wabtec was previously awarded a contract for Computer Aided Dispatch (CAD) which will be integrated as part of this contract to complete the heart of the PTC Office Segment. The Office Segment systems must be operational for the test corridor testing in 2014. Funding from the State of Alaska in FY 2014 enabled ARRC to award this contract.
- ARRC has upgraded and installed wayside and communications systems in the test corridor between Anchorage and Whittier. Ten manual switches now have all PTC required hardware in place. PTC software was tested for 80% of the locations in the test corridor.
- A contract was awarded in December to extend the ARRC wayside signal system 26 miles from Pittman to Kashwitna. This extension will be PTC compatible when completed in fall of 2014.
- ARRC forces also installed cabling, improved switch hardware, and made track modifications at several sidings between Willow and Talkeetna.
- ARRC awarded a contract to Wabtec Global Services for \$1.6 for the installation of PTC equipment and radios in all of ARRC's 54 locomotives and cab control equipment. Further, ARRC completed procurement for all essential materials for the locomotive installation and began receiving materials. Locomotive installation kits began shipping from the vendor on December 30, 2013.



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- Engineering progressed for communication sites from Portage to Seward.

Next Quarter Outlook

Next quarter activities are planned to include:

- Complete field testing of PTC software at wayside locations in the test corridor and deploy software to all wayside locations in the test corridor to prepare for the required Federal Railroad Administration witnessed testing.
- Continue to integrate the Geographic Information Systems (GIS) data into the various PTC data bases for the test corridor.
- Begin locomotive on-board equipment installations in late February. This is expected to continue through fall 2014.
- Secure required 220 MHz radio frequency licenses.
- Continue design and procurement activities for summer 2014 wayside construction projects.
- Complete testing of the replacement Computer-Aided Dispatch system and perform the cutover on January 16, 2014.

Alaska Work Force (this quarter)

Alaska Railroad employees' full-time equivalents: 20

Alaskan companies providing services:

Suppliers

- | | |
|---|-----------|
| • Potelcom Supply Inc.: Communications supplies | Anchorage |
| • Right Systems: Servers | Anchorage |
| • Alaska Battery Mfg.: Batteries | Anchorage |
| • Marsh Creek: Power systems and design | Anchorage |
| • Airport Equipment Rentals: Equipment rental | Anchorage |
| • Alpine Air Alaska: Transportation | Girdwood |
| • American Power Systems: Electrical | Anchorage |
| • Equipment Source Inc: Electrical | Anchorage |
| • McGrady Steel and Supply: Electrical | Anchorage |
| • Yukon Equipment: Equipment rental | Anchorage |
| • AT&T Alaska: Communications | Anchorage |
| • Alpine Meadows Apts: Lodging | Anchorage |
| • Cal Worthington Ford: Auto leasing | Anchorage |
| • Suburban Propane: Fuel | Anchorage |
| • Carlile Transportation: Trucking | Anchorage |
| • Peak Signals: Telecom upgrades | Juneau |
| • New Horizons Telecom: Telecom upgrades | Palmer |
| • R&S Railworks: Track materials | Healy |
| • Chugach Electric Association: Power | Anchorage |
| • Matanuska Electric Association: Power | Palmer |
| • Alaska Industrial Hardware: Tools/eq | Anchorage |



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- **NC Machinery:** Equipment rentals Anchorage
- **Warning Lites Of Alaska:** Traffic control Anchorage
- **TRIJET Precision:** Metal fabrication Palmer
- **Statewide Mechanical:** Locomotive PTC Install Anchorage

Engineering

- **HDR Alaska:** Engineering & construction mgmt Anchorage
- **Shannon & Wilson:** Geotechnical services Anchorage
- **MBA Consulting:** Electrical eng'g services Anchorage

Professional Services

- **JACS Consulting Services:** Programming Anchorage
- **Resource Data Inc.:** Programming Anchorage

Funding Summary

through December 31, 2013	Federal Funds/ARRC	State FY 14 Funds	Total
Overall PTC Integration and Management	\$26,557,997	\$4,181,500	\$30,739,497
Office Segment	\$17,591,965	\$2,253,035	\$19,845,000
Locomotive Segment	\$3,663,749	\$3,813,210	\$7,476,959
Communications Segment	\$7,803,271	\$3,815,220	\$11,618,491
Wayside Device Monitoring	\$8,197,729	\$5,037,035	\$13,234,764
Total	\$63,814,711	\$19,100,000	\$82,914,711
Funds Committed	100%	72%	
Funds Spent	94%	8%	

2015 – 2018 PTC – Cash Flow Requirements (Unfunded)

	2015	2016	2017	2018	Total
Office, Comm and Locomotive Segments	\$ 10,784,110	\$ 7,717,322	\$ 5,756,240	\$ 4,556,240	\$28,813,912
Overall PTC Integration and Management	\$ 4,759,697	\$ 4,267,322	\$ 3,106,240	\$ 2,906,240	\$15,039,499
Locomotive Segment	\$ 3,420,509	\$ 800,000	\$ 1,300,000	\$ 300,000	\$ 5,820,509
Communications Segment	\$ 1,483,904	\$ 1,300,000	\$ 300,000	\$ 300,000	\$ 3,383,904
Office Segment	\$ 1,120,000	\$ 1,350,000	\$ 1,050,000	\$ 1,050,000	\$ 4,570,000
Wayside Segment	\$ 9,414,400	\$ 12,911,600	\$ 10,467,000	\$ 8,102,600	\$40,895,600
Monitoring CTC Signal and Switches	\$ 2,000,000				\$ 2,000,000
Dark Territory Manual Switch Monitoring	\$ 7,414,400	\$ 12,911,600	\$ 10,467,000	\$ 8,102,600	\$38,895,600
Total Funds Required	\$ 20,198,510	\$ 20,628,922	\$ 16,223,240	\$12,658,840	\$69,709,512



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PTC Implementation Schedule

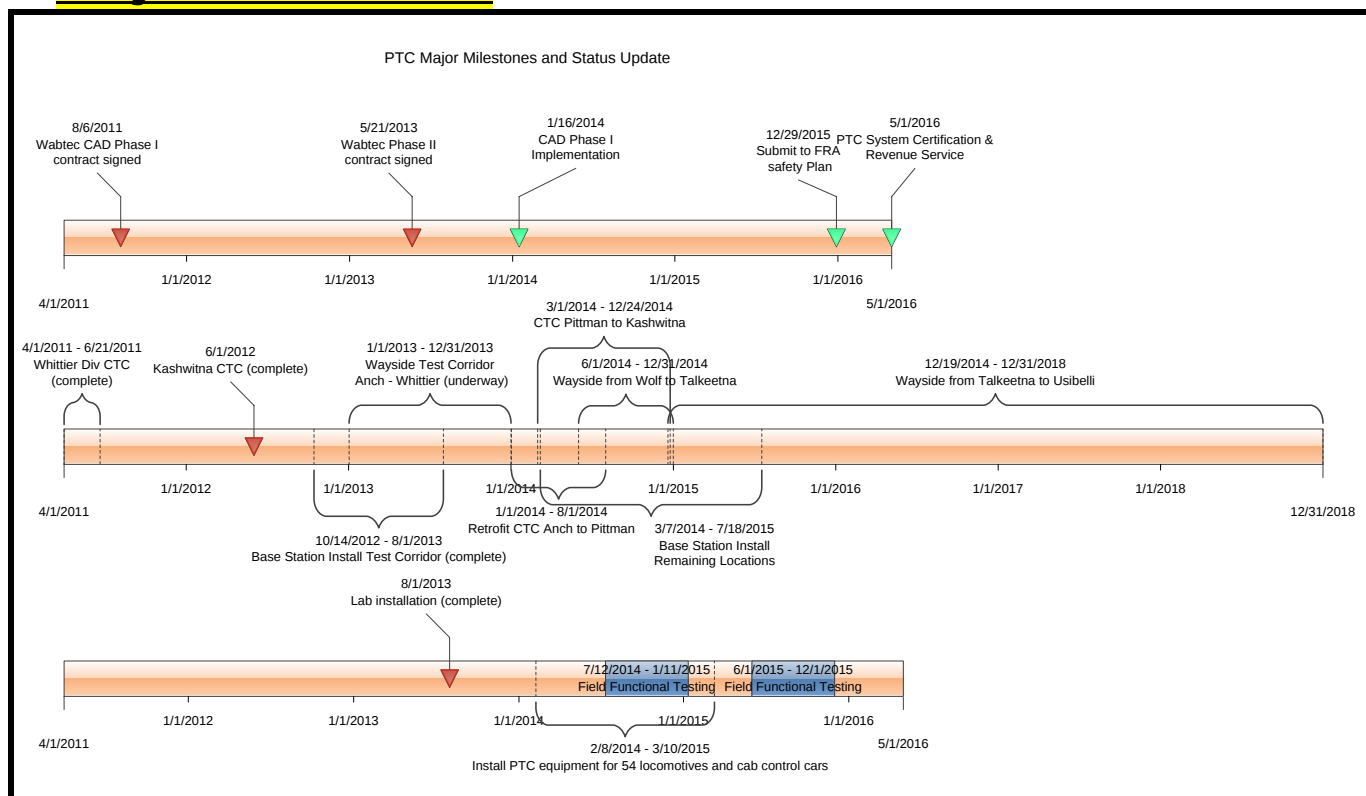
Original Estimated PTC Implementation Date:

December 2018

Current Estimated PTC Implementation Date:

December 2018

Project Milestones





Positive Train Control

ARRC Project Staff

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