

**From:** [Price, Beau D](#)  
**To:** [FRA Waivers](#); [Alexy, Karl \(FRA\)](#)  
**Cc:** [Price, Beau D](#); [Solomons, Keith](#); [Schulze, Mark](#); [Ratledge, Aaron](#); [Rodriguez, Edmundo](#); [Soto, Bruno](#); [Baldwin, Matthew A](#); [Zuiderveen, Steven \(FRA\)](#); [King, Charles \(FRA\)](#); [Fairbanks, Gary \(FRA\)](#); [Alexy, Karl \(FRA\)](#); [Dortch, Demond](#); [Weiskittel, Adam](#)  
**Subject:** FRA-2018-0049 - BNSF Petition to FRA Safety Board Expanding BHE Program to Coal Operations with Labor & Test Committee Support  
**Date:** Friday, June 23, 2023 6:18:50 PM  
**Attachments:** [BRC Technology Partnership 5.23.23 Wheel Detection LOU.pdf](#)  
[DRAFT BRC BNSF BHE Release 061923.pdf](#)  
[BHE Test Committee Quarterly Update 6 22 2023 Final.pdf](#)  
[BHE Meeting Participants 6 22 2023.xlsx](#)  
[BHE Quarterly Committee Meeting & Coal Train Expansion Vote Minutes 6 23 2023 Beau Price.docx](#)  
[Rodriguez E - BHE Support Letter June 5 2023.pdf](#)  
[BNSF Requested BHE Expansion Coal Trains with BRC Carman Support 6 20 2023.pdf](#)  
**Importance:** High

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**CAUTION:** This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon Karl,

Please find attached BNSF's formal request of the safety board to expand FRA-2018-0049, the BNSF Brake Health Effectiveness (BHE) waiver, to include our loaded and empty coal trains out of the Powder River Basin. The addition of BNSF coal trains will increase the number of car types, train types and corridors using the BHE technology to improve car braking systems. The Brotherhood of Railway Carmen (BRC) has also come out in support of the technology and processes in use in the BHE Program.

This expansion of the BHE program will add BNSF coal trains under the waiver to the current grain and intermodal trains. BNSF has tested over 24,000 trains under the waiver which has led to carmen performing over 38,000 automatic single car tests (ASCT). This extensive brake evaluation program has led to the replacement of over 41,000 air brake related repairs and the replacement of more than 18,000 valves where most were either Service or Emergency portions.

Attached you will find:

- Petition Letter "**BNSF Requested BHE Expansion Coal Trains with BRC Support 6 20 2023**"
- BRC Letter from Don Grissom to Edmundo Rodriguez (AVP and CMO BNSF Railway)
- Letter to BRC from BNSF on LOU on partnering to expand Technology (BHE and Vision Systems)
- Press Release on BRC and BNSF Partnering to Advance Technology Initiatives
- BHE Test Committee Quarterly Meeting Presentation
- BHE Test Committee Meeting Minutes – Unanimous Votes to (1) Approve expansion of BNSF BHE into Coal (2) Continue BHE Program for next six months (3) Approve new detector technology (4) Approve Relocation of several BHE sites to improve Reliability and Maintainability.
- BHE Test Committee Attendance

Please let me know if you or your staff have any questions or concerns regarding the expansion request, the performance data or BNSF's next steps in expanding use of this technology. I have also included the original video link to support understanding the BHE processes for those who may be new to the safety board or were not in that role when the program was rolled out in 2018.

<https://vimeo.com/bnsfrailway/coldwheeldetectorwaiver>

We greatly appreciate your consideration in this matter.

Beau Price

**Beau Price | Director Locomotive & Air Brakes**

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Beau D. Price  
Director Locomotives & Air Brakes

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VIA ELECTRONIC FILING

June 23, 2023

Karl Alexy  
Associate Administrator for Railroad Safety  
Chief Safety Officer  
Federal Railway Administration  
1200 New Jersey Avenue, SE  
Washington, DC 20590

**Re: FRA-2018-0049 BRC & Waiver Test Committee Support Adding Coal FRA-2018-0049**

Dear Mr. Alexy:

BNSF Railways (BNSF) has worked closely with labor organizations, the FRA and all other committee members in the Test Committee structure to demonstrate the multi-faceted benefits of the Brake Health Effectiveness (BHE) program on freight car braking systems. The benefits have been proven on intermodal trains and grain trains but to date have not been tested in the BNSF coal fleet.

BNSF is now petitioning to add coal trains under the waiver in accordance with the waiver conditions under FRA-2018-0049 and subject to prevailing conditions for all of the following reasons outlined below in the balance of this letter.

#### **TEST COMMITTEE w/ LABOR APPROVE EXPANSION REQUEST FOR COAL**

The attached presentation **BHE Test Committee Quarterly Update 6 22 2023 Final**, was audited and reviewed with the Test Committee during our quarterly meeting on June 22<sup>nd</sup>, 2023. The attendees and minutes for that meeting have also been submitted to the official docket.

Voting occurred on four aspects of this waiver after a review of the data and the requests were completed. The result of the voting are summarized below but can be found in more detail in the attachment with this letter, "**BHE Quarterly Committee Meeting & Coal Train Expansion Vote 6 23 2023**".

1. **Vote to expand BHE program to address coal trains** (start training program for Signal, Mechanical & TY&E Teams)

2. **Vote to utilize fully tested new “Phoenix” detectors to replace “PowerView” system** (benefits to reliability & maintainability – Phoenix Scanners also can be used to monitor locomotive traction motors to identify traction motor hot bearings and gears)
3. **Vote to relocate several detectors for reliability & maintainability impacts**
4. **Vote to continue the BHE Waiver for the next six months**

*The voting was unanimous in support on all four initiatives from the groups respesented below. There was no opposition or outstanding concerns raised by the members of the committee:*

- BRC
- SMART-TD
- BLET
- FRA DC
- FRA Regional Specialists (Districts 8,7,6,5 & 4)
- Sharma & Associates
- AAR
- NYAB
- WABTEC
- BNSF (Mechanical & Transportation)
- TTX

#### **THE BRC ON RECORD IN SUPPORT OF BNSF BHE PROGRAM**

The Brotherhood of Railway Carmen (BRC) and General President, Don Grissom have worked closely with BNSF and the test committee and have gone on record supporting the BNSF BHE program and the way the technology is being implemented. A letter to that effect is provided as an attachment to this petition and is included in the submission to the Federal Register, **Rodriguez E – BHE Support Letter June 5 2023.**

#### **BENEFITS OF BHE PROCESS FOR COAL TRAINS**

The additions of BHE processes under FRA-2018-0049 Brake Health Effectiveness (BHE) to include coal trains operating over the Pikes Peak Subdivision in Colorado and across the Sandhills Subdivision of Nebraska will accomplish all of the following benefits

- Improve train braking performance and safety by reducing brake pipe air losses on all BNSF Coal Trains (Even more important during winter operations when air leaks increase)
- Identify individual cars whose brakes don’t perform as intended creating both cold and hot wheels while in use (This is after 100% BRC carmen Class 1 Brake Test when train originated)



- Increase carmen workload at destination by specifically identifying cold or hot wheels (CWs), requiring the FRA Automatic Single Car Test (ASCT) on hundreds of uniquely identified coal cars which are moved safely to destination where an investigation and repairs will take place
- BHE testing of brakes occurs while trains are moving in revenue service at lower braking forces than being used in a standard FRA Class 1 “Static Test”
- BHE testing identifies and drives repairs of “hidden” air leaks on cars that when not corrected lead to additional fuel consumption (Locomotive air compressors have to make up the air losses)
- BHE process identifies defects or issues that the human eye can not easily identify and supplements carmen with technological derived information to improve the repair process

### **EMPIRICAL DATA - BHE WAIVER RESULTS (6/14/2023)**

- 24,372 Waiver Trains Successfully Operated – 80.2% of Eligible trains PASS Performance Test
- *38,072 Automatic Single Car Tests (ASCT) Performed by Carmen As Result of BHE Testing*
- Over 7,100 Service & Emergency Valves Replaced as a Result of BHE Required ASCT
- 21,041 Cold Wheel Notifications and 1,704 Hot Wheel Notifications Identified
- 41,092 Repairs made and billed by BRC Carmen
- 18,000 Valves Replaced (Primarily Service and Emergency but Retainer, Vent & Empty Load)
- Very Low “Repeater” Rates for Trains Under the Waiver

### **BNSF GUIDANCE ON ADDING COAL TRAINS**

In building on the ongoing success on the Southern Transcon intermodal trains and Northern Transcon grain & intermodal trains, BNSF would add coal trains under the waiver with detectors in two sites to cover both loaded and empty coal train routes.

Please find detailed information in attached, **BHE Test Committee Quarterly Update 6 22 2023 Final**. The loaded and empty routes are provided below along with locations for the detector sites.

## LOADED CYCLE



Loaded trip 1,516 train miles

- Current State
  - Extended Haul inspection at Amarillo, TX
- Future State
  - BHE inspection at Pike’s Peak detectors
  - Bypass Amarillo with a passing BHE test
  - Revert to standard manual inspections on Fail/No Test events

## EMPTY CYCLE



Loaded trip 1,516 train miles

- Current State
  - Extended Haul inspection at Temple, TX and Alliance NE
- Future State
  - Eliminate inspection at Temple, TX
  - Extended Haul inspection in Alliance, NE
    - All CW defects setout and repaired in Alliance
  - Total manual inspection interval approximately 3,000 miles

Training to commence at the following locations:

- Alliance, NE,
- Temple, TX
- Amarillo, TX
- Guernsey, WY
- Donkey Creek, WY
- Lincoln, NE

The reporting, tracking and compliance to all waiver conditions would be consistent with the existing locations and trains under the waiver that has been ongoing for nearly four years.

BNSF has installed, tested and validated the required detectors at the “Pike’s Peak” site and the sites on the “Sand Hills” subdivision. These detectors were installed to continue the BHE testing in a cold weather climate and applied in locations that allows for the testing of south bound loaded coal trains and those primarily headed eastbound. The processes & parameters will follow the general conditions of Southern Transcom BHE Program but differ in that that the trains “cycle” and stay intact in unit train operations much like the Northern grain trains under the waiver and will have all of their CW events addressed at the origination locations with the heaviest volume at the Alliance, NE location.

#### **SUMMARY**

The expansion of waiver FRA-2018-0049 for unit coal trains will accomplish all the benefits outlined in this document and the attached presentations. Adding BHE processes to coal trains will generate important work for the BRC carmen and it is fully supported by the waiver test committee. The process of control for this waiver are well documented and very stable and this waiver is benefiting train braking and safety every day.

If you have any questions or require more information, please contact me at your convenience. Thank you in advance for your consideration.

Cordially,

*Beau D. Price*

Beau D. Price

Director of Locomotives & Air Brakes

CC: FRA – Charles King, Gary Fairbanks, Steve Zuiderveen, [FRAWaiver.gov](http://FRAWaiver.gov)

BNSF Railway- Keith Solomons, Edmundo Rodriguez, Matt Baldwin, Gretta Baker, Brandon Mabry, Bruno Soto, Aaron Ratledge, Mark Schulz, Doug Jones, Paul Kuhn, Matt Garland, Edmundo Rodriguez, Abid Raza, Bret Bridges



# Brotherhood Railway Carmen Division

*Transportation Communications Union/IAM*

**Donald E. Grissom**  
*General President*

June 5, 2023

VIA MAIL

Edmundo Rodriguez  
BNSF Chief Mechanical Officer

The BRC has consistently been engaged in working with the BNSF Railway, FRA and all of the test waiver committee participants for the past four years on the BHE (Brake Health Effectiveness) test waiver **FRA-2018-0049** as it was applied to Intermodal and grain cars on the BNSF network. We(I) have been very critical of the processes from the onset that were being used by BNSF as they worked to demonstrate how technology could lead to technologically improved processes for identifying underperforming braking issues on cars. We (I) have been diligent in pointing out situations where certain elements of the program were not being conducted with the consistency and openness that was needed to have a fair assessment of the technology. We have focused on having transparency in the processes and data as we tried to determine if the technology could be supported the BRC and its members.

The BRC will have the opportunity now to review several years of the data generated by the BNSF BHE test waiver program and will continue to review going forward. We have had the chance to refine processes for tracking cars and have made changes to improve the program through added monitoring and involvement. This ongoing relationship with BNSF and the FRA in utilizing and testing new technology has had its challenges but it has been instrumental in validating that this technology could be supported by the BRC.

Until now, we have been insistent that BRC would not support the expansion of this program into the BNSF coal fleet until we felt confident that the processes worked, the benefits and shortfalls were understood and to the extent possible we protected our work and the safety of the public. We have determined we are gaining more ASCT events and car repairs as we use the BNSF BHE processes and are having a positive impact on safety and car & train braking performance.

So, at this time, BRC is willing to support the expansion of the BNSF BHE program into the coal fleet as long as the consistency and process controls we have helped to develop are continued as we begin analyzing cars for cold wheels on coal trains. We will also look to make sure the conditions of the waiver continue to be followed and there is openness and transparency in process decisions. We will continue to closely monitor the BNSF BHE program both in intermodal, grain and now coal which relies on dedicated Carmen continuing their efforts in finding and repairing cars which have been flagged with cold wheels.



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Sincerely,

*D.E. Grissom*

D.E. Grissom  
General President  
Carman's Division TCU/IAM

Cc: Charlie King: FRA  
Derek Cargill: LR  
Carl Lakin: AVP/BRC  
Darren Treiber: GVP/BRC  
Dan Chancellor: NR  
Justin Johnson: ANR



**Derek Cargill**  
General Director  
Labor Relations

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2600 Lou Menk Drive  
Fort Worth, TX 76131-2830  
Phone: (817) 352-1046

May 23, 2023

Mr. Daniel Chancellor  
National Representative, BRC  
P.O. Box 343  
Hemingford, NE 69348

**Re: Letter of Understanding**

Dear Mr. Chancellor:

This letter will memorialize our understanding regarding the utilization of carmen to support vision-based technology inspection and detection for trains departing from originating and/or intermediate terminals.

It is understood that two carmen positions will be created in connection with this letter of understanding. To the extent the utilization of wayside vision systems is authorized and implemented for trains departing from selected originating and/or intermediate terminals, these positions will help support the use of such systems for purposes of conducting and/or bypassing originating, intermediate inspections. The parties agree to work together in collaboration with the FRA to utilize vision-based technology inspection and detection for select originating and/or intermediate terminals.

One position will be established for the northern part of the BNSF system, and the other will have responsibility for the south. These positions will be advertised to BNSF journeyman carmen in a manner to be determined by BNSF, and BNSF will have the right to assign employees to these positions, after considering qualifications, aptitude, work history, and seniority. Interviews may be conducted to determine the selection of the most qualified applicants for these positions. Employees may be removed from these positions if it is determined they lack the required aptitude and/or competency to perform the duties of the positions at an acceptable level. It is understood that positions may be added or reduced as necessary based on business volumes.

Carmen filling these positions will be compensated at the prevailing journeyman carman rate of pay. The hours for the positions will be 0700 to 1500. The starting time may be adjusted as necessary within a range of two hours, provided five calendar days advance notice is provided to the incumbent of the position. Positions established pursuant to this LOU will be based out of Fort Worth. Employees selected to fill these positions, who are required to relocate, will be eligible for the relocation assistance set forth in Rule 36 (f) of the May 4, 2020 Agreement. To qualify for these benefits, the employee must make a bona fide relocation of their principle place of residence at least 100 miles (by closest highway route) from their old headquarters point.

Employees selected to fill these positions will be subject to a three-year hold down period beginning on the first day worked, and will not be permitted to exercise seniority back to their original seniority district/point during such period. If this Agreement is cancelled by either party during an employee's three-year hold down period, the employee will be eligible for relocation assistance (as set forth in Rule 36(f)) to return back to their home seniority point. If the employee resigns, voluntarily accepts a new position after the three-year hold down period expires, is terminated, or is disqualified, he or she will not be eligible for relocation assistance to return to their home point.

Employees selected to fill these positions will retain and accrue seniority on their current seniority roster, and will not establish seniority on another roster while assigned to a position set forth in this agreement. Employees returning to carman service at the end of an assignment covered by this agreement will return pursuant to the provisions of Rule 34 of the May 4, 2020 Agreement.

The parties understand that the work of supporting vision-based technology and inspection, and all other work assigned to carmen positions described in this agreement is not currently covered by the BNSF/BRC Agreement, and as such, carmen forces have no claim to this work. To the extent that carmen perform the work set forth in this Agreement exclusively and consistently for a period of ten consecutive years from the date the first position is filled, the work will be considered covered by the BNSF/BRC Agreement. If the Agreement is cancelled by either party prior to the expiration of the ten-year period, the work will not be considered exclusive to the carman craft and the parties will revert to their original rights as they existed prior to the execution of this Agreement. It is also understood that this Agreement and the performance of the aforementioned work shall not be referred to in any other proceeding of any kind whatsoever, excepting only a proceeding to enforce the terms of this Agreement.

Upon a 30-day advance written notice this agreement may be canceled by either party signatory hereto. The parties will agree to meet or conference during the 30-day period to discuss the reason for cancellation and to discuss the possibility of reaching a revised agreement.

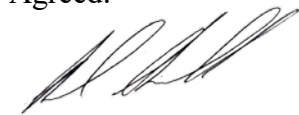
If this correctly reflects our understanding, please sign in the space provided below, and return to this office.

Sincerely,

*Derek Cargill*

Derek Cargill

Agreed:



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Daniel Chancellor  
National Representative  
BRC



Contact: Zak Andersen  
817-867-6250  
[Zak.Andersen@bnsf.com](mailto:Zak.Andersen@bnsf.com)

FOR IMMEDIATE RELEASE

## **BNSF and BRC Join Forces to Drive Safety**

FORT WORTH, Texas, June XX, 2023 – The Brotherhood Railway Carmen Division (BRC) and BNSF Mechanical continue to partner on safety. As a result of this partnership, BRC expressed their support for BNSF’s effort to expand the Federal Railroad Administration’s test waiver for the Brake Health Effectiveness Program (BHE).

BHE is a safety technology that measures the temperature of car wheels as the train passes through detectors where the wheels are analyzed to ensure the braking systems are operating properly. The technology assists the BRC inspectors by focusing their inspection and repair efforts on specific cars which helps make the inspection process more effective. If no defects are found, the train will continue to its destination. BNSF implemented the technology four years ago on intermodal and grain cars through a FRA test waiver.

BRC and BNSF are now partnering to request expansion of the FRA test waiver after seeing the positive results of the original program.

“The BRC and BNSF are working together to support the expansion of a technology that has a positive impact on rail safety and train braking performance,” said Donald Grissom, General President, BRC.

“We’re proud to partner with BRC to develop and implement technology that drives a safe and efficient rail network,” said Keith Solomons, BNSF’s vice president, Mechanical. “Embracing technological developments like BHE not only creates a safer network, but ultimately allows us to grow the railroad together which is in the best interest of all of us.”

BHE is not the only technology where BRC and BNSF are working together. We are also collaborating on future technologies, specifically machine vision that has the potential to drive additional safety gains for car inspectors and serve as a tool to make inspections more effective.



BNSF continually looks for opportunities such as BHE to partner with all of our union employees to advance safety and service through technology.

###

# BHE Program Update

**Beau Price**

DIRECTOR LOCOMOTIVE & AIR BRAKES

JUNE 21, 2023



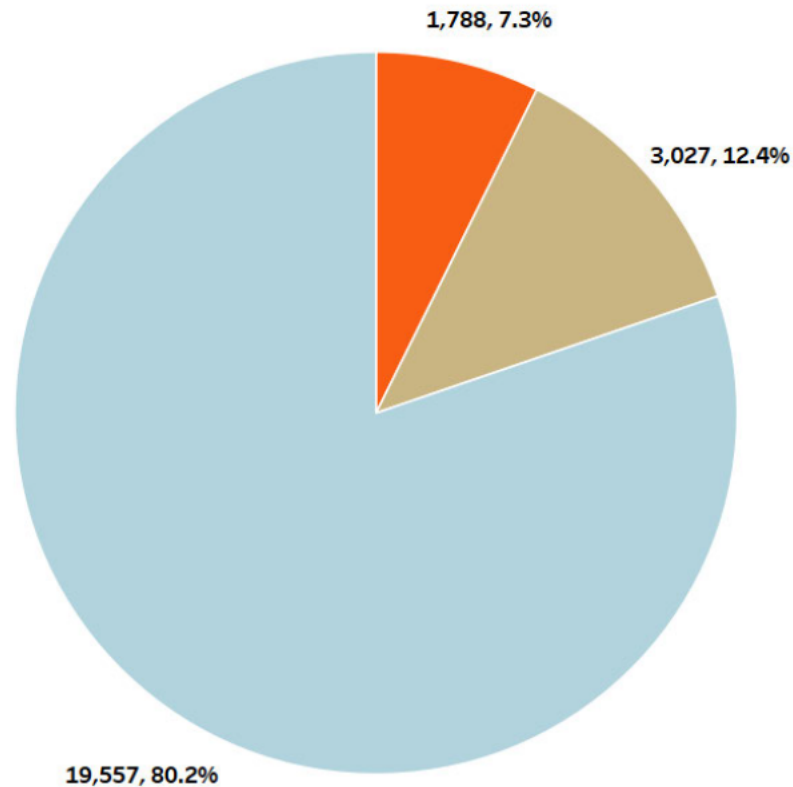
# AGENDA



- Attendance
- Review BHE Train Performance Metrics
- Review Train Types Under the Waiver
- Review Labor Analysis & Increased Car
- Update on “Coal Train Expansion” Petition to FRA
- Next Steps & Questions

# BHE Train Testing Results 8/29/2019 – 6/13/2023

BHE Testing Results  
8/29/2019 - 6/13/2023



24,372 Trains Operated Under Waiver (Over three years of Successful Operation)

80.2% Overall Pass Rate – 95% Verified Effective Brakes

12.4% No Test & Get Intermediate Inspection

7.3% Fail & Get Intermediate Inspection



# BHE Train Defect Ratio (8/29/2019 – 06/14/2023)

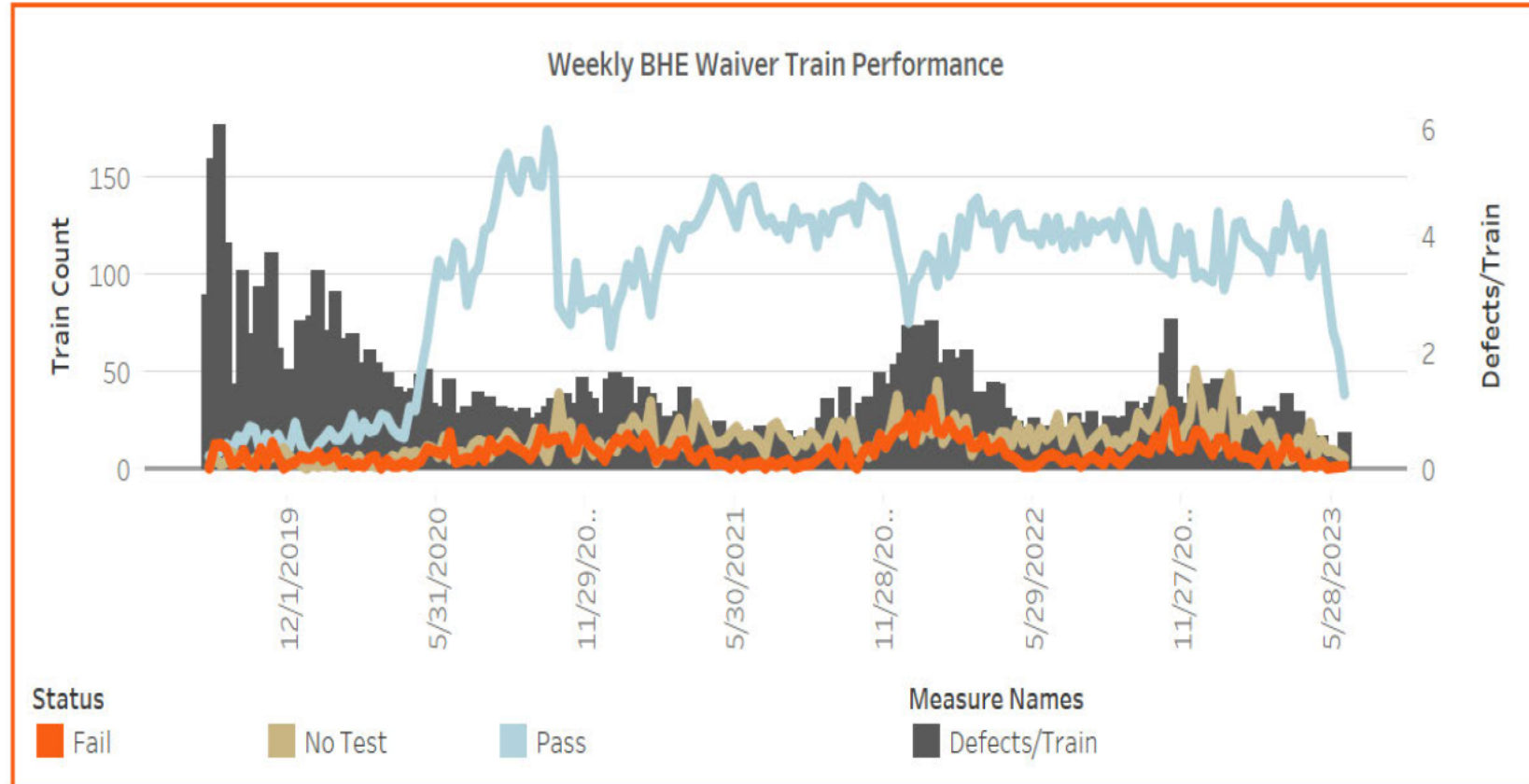


Currently in summer operations reduced defect rate on a car per train basis currently = 1 / Train

Winter operations see the defect rate increase based on cold weather air issues then reduces in summer

Train volumes pretty stable 120 to 130 trains per week last 6+ months of 2023

**We have a stable, predictable understanding of how waiver trains perform.**

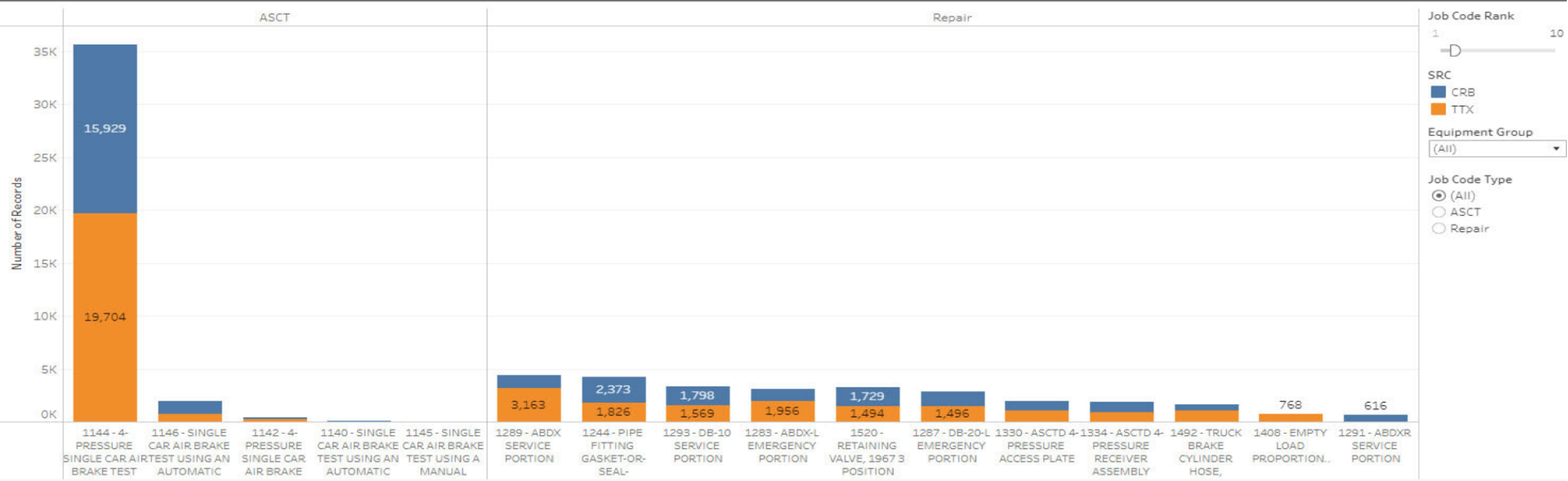


# BHE Flagged Cars – 38,067 ASCT & 41,092 Repairs

## BHE Waiver Summary

ASCT & Repair Totals		Alarm Totals	
Repair Date	8/28/2019	Alarm Date	8/28/2019
	6/14/2023		6/14/2023
<b>38,072</b>	<b>41,095</b>	<b>1,704</b>	<b>21,041</b>
Total ASCT's	Total Repairs	Hot Valve Alarms	Cold Valve Alarms

## ASCT & Repair Breakdown



# BHE Flagged Cars – 18,000 “Valves” Replaced



**In the 41,092 Repairs on waiver trains our BNSF & TTX Carmen are replacing thousands of valves that are being removed for their brake performance and not an arbitrary “time” element:**

## ***Brake Related Valves Changed:***

- **Service Valves Replaced**
- **Emergency Valves Replaced**
- Retainer Valves & Vent Valves
- Empty Load Valves Replaced

***Total Exceeding 18,000 Valves***

## ***Processes Working Very Well:***

- Carmen were notified the “car” had a brake issue...
- Carmen complete the ASCT when car at destination...
- Carmen complete Repairs ...
- Carmen Documented and billed...

**Brake Performance and Safety Improved on cars under the waiver!**

# BHE Train List Update Sent Weekly to FRA



- 156 Intermodal Train Symbols Under BHE Waiver (Increase 3 vs last Review)
- 133 Potential Grain Trains Under BHE Waiver (No Change vs last Review)
- No coal trains at this time

***Additional symbols can be added as long as the locations served have had the necessary BHE training...***

Please add the symbols below to our BHE waiver list and EQMS with our FRA submission today.

## **WESTBOUND CANDIDATES**

Base Train	M	T	W	T	F	S	S	Arr Time	Dpt Time	D
-----	-	-	-	-	-	-	-	-----	-----	-
S-LPKOIG1-L1			3						0400	W
Q-CHIPHX6-V2					5				0830	W
Z-CHISBD6-L3	1				5	6	7		1135	W
Q-CHIPHX6-V1		2							1430	W
Q-ATGLAC6-L	1	2		4	5	6	7		1715	W



# Process Control Documentation Daily



## Tracking Daily:

- Cold Wheel CW Repeaters
- Location Impacts by volume of CW directed at a location
- 4-Pressure Testing occurring / 4-Pressure Plates Applied

### Cold Wheel Repeaters

1 Total Repeaters - Yesterday

Last BO Station	CAR	Car Kind	Current BO Station	Current BO Date	Current Defect	Last BO Date	Last Defect	Release Track	Release Time	Days to Fail	Current BO Date
CICERO IL	DTTX 728157	QV3	CICERO IL	6/19/2023	CW-COLD WHEEL-BRAKE HEALTH	5/24/2023	CW-COLD WHEEL-BRAKE HEALTH	1202	6/9/2023 10:56:54 AM	26	6/19/2023 to 6/21/23
											Current Defect All

Good Morning Team,

We started today at 55(0) CW cars on the system. There are 10(-7) in route and 45(+7) cars at destination. Please reach out to the System Car team for any questions or support.

Also attached are open MA-0999 alerts. The cars on this report did not receive an ASCAT at destination per BHE waiver guidelines. Every attempt needs to be made to capture these cars and perform air tests immediately in order to clear MA.

CW Summary

LOCATION	BO at Destination	BH Online	Total Workload	Workload Baseline
SANBERNARCA	6	4	20	10
CHICAGO IL	7	3	20	20
PORTLAND OR	5	0	5	15
LOSANGELECA	3	2	5	15
LOGPARCHIL	3	1	4	
ALLIANCE TK	3	0	3	
STPAUL MN	2	0	2	
STOIMF CA	2	0	2	12
STOCKTON CA	2	0	2	1
SSEATTLE WA	2	0	2	11
PHOENIX AZ	2	0	2	5
LONBEATPICA	2	0	2	
CICERO IL	2	0	2	
NBAY CA	1	0	1	
MEMPHIS TN	1	0	1	4
LOGPARKANKS	1	0	1	7
BARSTOW CA	1	0	1	
Grand Total	45	10	55	100
	BO at Destination	BH Online	Total Workload	Workload Baseline

SYSTEM - Active Cars Online - None

For MA0999 - BNSF(MA)-MISSED ASCAT PER BRAKE HEALTH EFFECTIVENESS-Severity - AZ-CAUSE FOR ATTENTION WHEN CAR IS ON SHOP OR REPAIR TRACK FOR ANY REASON

# BHE & Carmen Labor Hours Analysis

## Total Eliminated Intermediate Inspections by BHE

- 14,959 train events – 672,900 equipment opportunities
- BNSF Intermediate Inspection Standards: AVG 1 minute per equipment = 672,900 minutes = 11,215 hours (2022 Belen averaging 0.82 minutes/car)

## Total of ASCT's Completed (using AAR standard hours for each specific job code)

- BNSF 12,671 = 9,568 hours
- TTX 15,433 = 10,855 hours

## Total of Brake Related Repairs Completed (using AAR standard hours for each specific job code)

- BNSF 13,745 = 4,994 hours
- TTX 15,312 = 8,942 hours

## Average Standard Hours (averaging all standard hours for all job codes within each group)

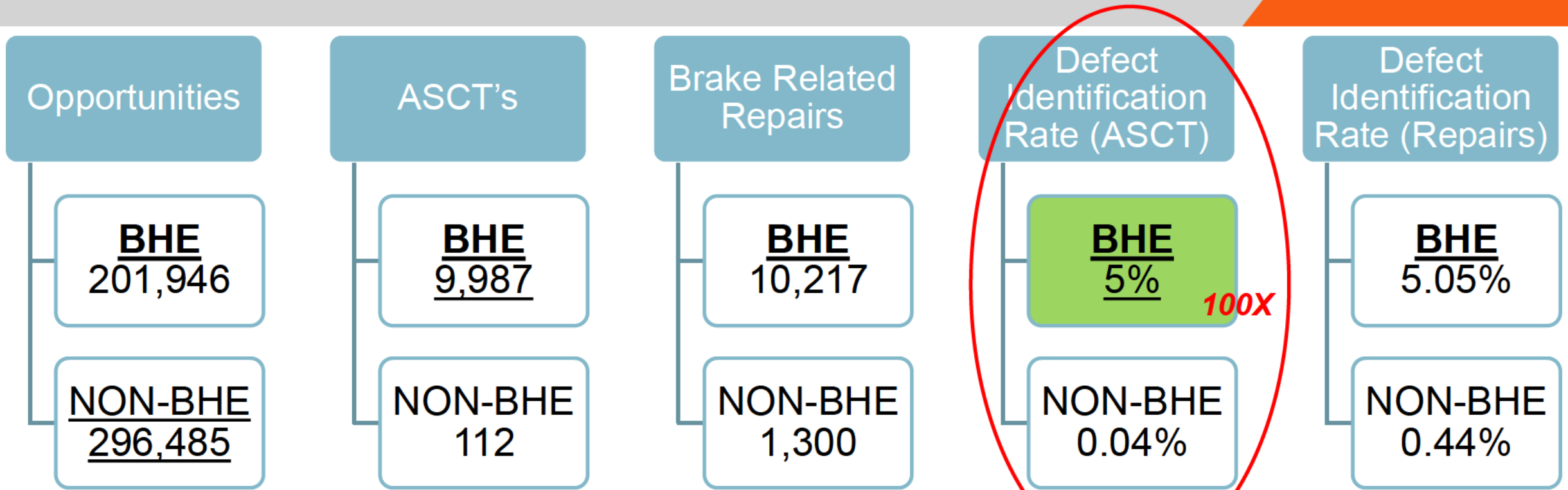
- ASCT 0.99 hours Per Car
- Repairs 0.333 hours Per Repair

Labor Hours  
Invested 34,359

Inspection Hours  
Eliminated  
11,215

Additional  
Carmen Hours  
+23,144

# BHE vs Non-BHE YTD Intermodal Summary



- BHE has **125 x higher rate** (ASCT) & **11 x higher rate** (Repairs) identification
- BHE has 100 x more ASCT's performed resulting in greater number of repairs compared to NON-BHE
- NON-BHE repairs did not all get ASCT & 50% repairs can be categorized as train yard adjustments (piston travel adjustment, slack adjustment, etc.) **Actual Repairs only 650 (Manual) vs 10,217 (BHE)**

# BRC & BNSF Partnering On BHE Technology



The Brotherhood Railway Carmen Division (BRC) and BNSF Railway have been working together to partner on safety and the development of BHE Technology.

Both organizations are seeing the benefits of working closely together on technology that improves safety and maximizes the effectiveness of the carmen's important role in maintenance of cars and critical systems like brakes.

Currently the key technologies that are jointly being evaluated are BHE and Vision Systems but this partnership is looking to continue these efforts with other developing technologies.



Contact: Zak Andersen  
817-867-6250  
[Zak.Andersen@bnsf.com](mailto:Zak.Andersen@bnsf.com)

FOR IMMEDIATE RELEASE

## **BNSF and BRC Join Forces to Drive Safety**

FORT WORTH, Texas, June XX, 2023 – The Brotherhood Railway Carmen Division (BRC) and BNSF Mechanical continue to partner on safety. As a result of this partnership, BRC expressed their support for BNSF's effort to expand the Federal Railroad Administration's test waiver for the Brake Health Effectiveness Program (BHE).

BHE is a safety technology that measures the temperature of car wheels as the train passes through detectors where the wheels are analyzed to ensure the braking systems are operating properly. The technology assists the BRC inspectors by focusing their inspection and repair efforts on specific cars which helps make the inspection process more effective. If no defects are found, the train will continue to its destination. BNSF implemented the technology four years ago on intermodal and grain cars through a FRA test waiver.

BRC and BNSF are now partnering to request expansion of the FRA test waiver after seeing the positive results of the original program.

"The BRC and BNSF are working together to support the expansion of a technology that has a positive impact on rail safety and train braking performance," said Donald Grissom, General President, BRC.

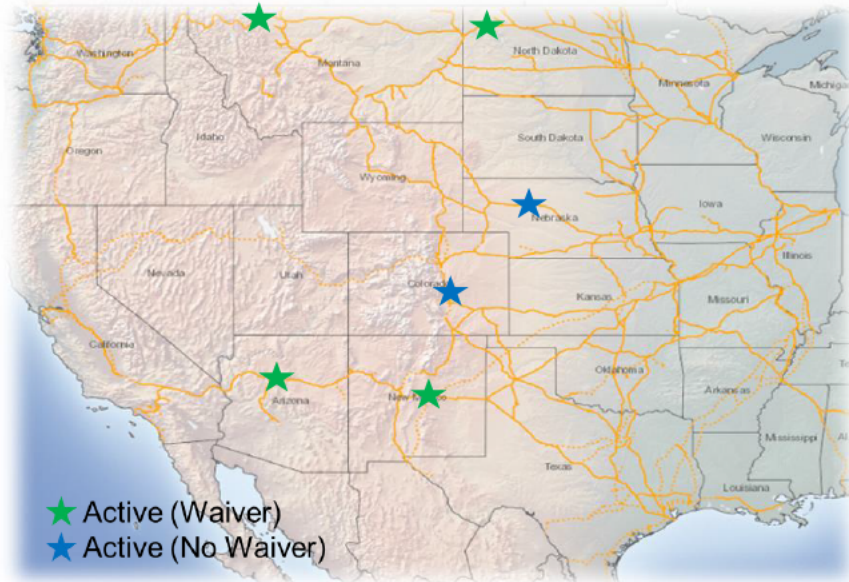
"We're proud to partner with BRC to develop and implement technology that drives a safe and efficient rail network," said Keith Solomons, BNSF's vice president, Mechanical. "Embracing technological developments like BHE not only creates a safer network, but ultimately allows us to grow the railroad together which is in the best interest of all of us."

BHE is not the only technology where BRC and BNSF are working together. We are also collaborating on future technologies, specifically machine vision that has the potential to drive additional safety gains for car inspectors and serve as a tool to make inspections more effective.

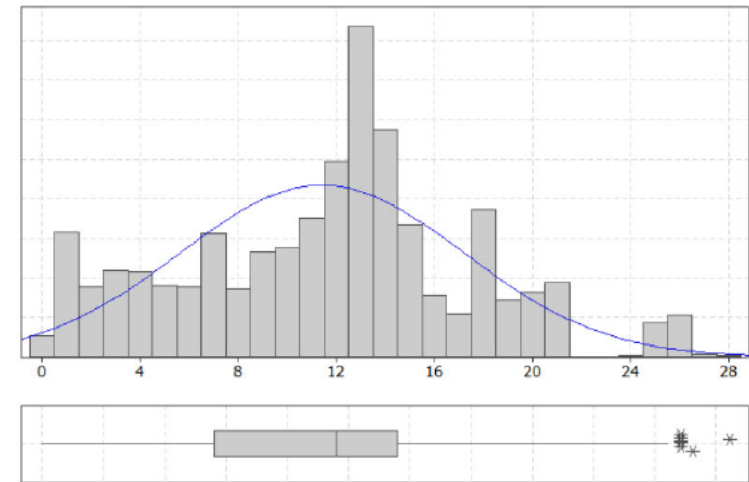


# Expansion Opportunities and Industry Need

- Intermodal and Grain are being operated and repaired under the waiver
- 2 sites installed on routes to capture coal traffic
- Proven method to identify brake performance and maintenance planning



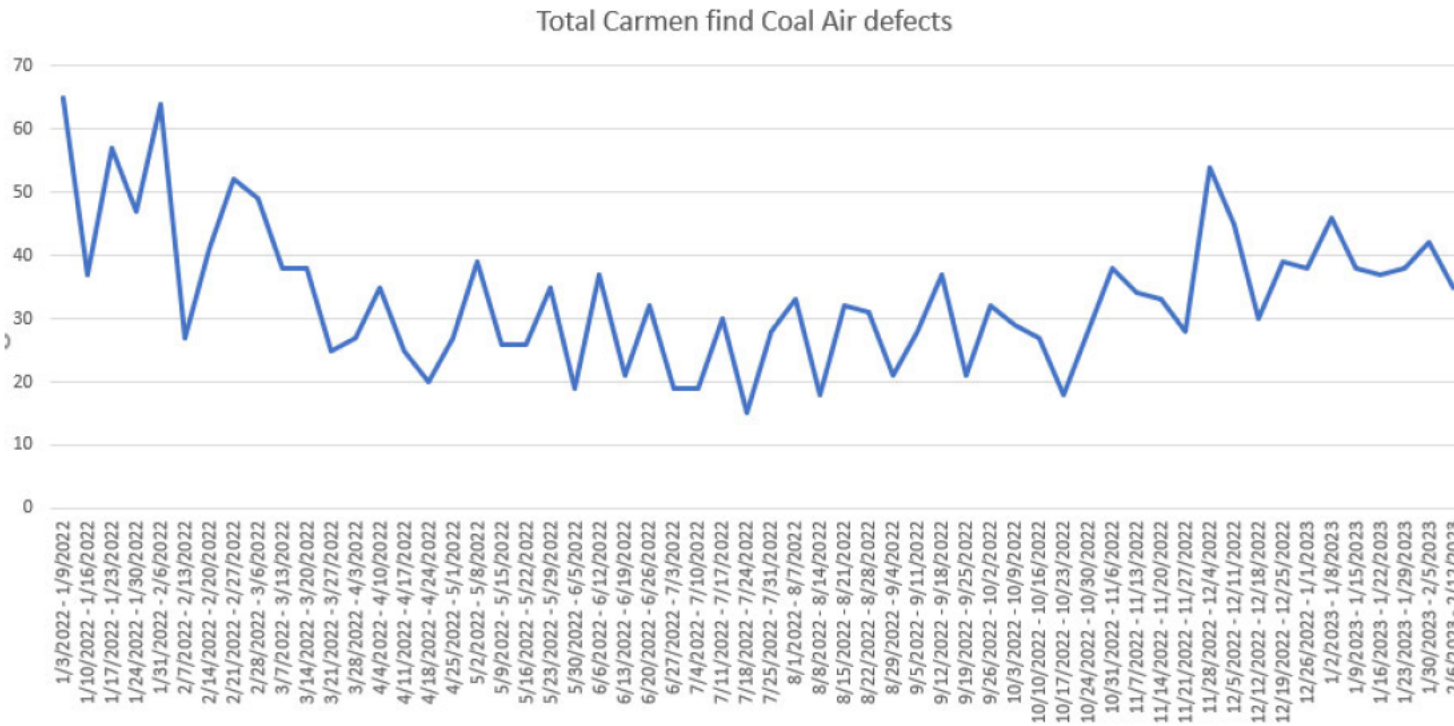
Air valve removals by age



## Coal Route Stats

- 164 coal trains/week
  - 1.7 defects per train average
- Over 37,000 overage valves in the industry, 24,000 (65% on coal cars)
  - BNSF has changed over 33,000 valves in our shops
- Technology driven approach to prioritizing and removing ineffective valves

# BHE Opportunities on Coal fleet



- Technology will assist in find more air defects not visible during manual inspections
- Currently average 33 air defects identified weekly across the coal network
- With current BHE footprint, estimate approximately 280 suspect cars

# Loaded Cycle example



- **Current State**
  - Extended Haul inspection at Amarillo, TX
- **Future State**
  - BHE inspection at Pike's Peak detectors
  - Bypass Amarillo with a passing BHE test
  - Revert to standard manual inspections on Fail/No Test events

*Loaded trip 1,516 train miles*



# Empty Cycle - example

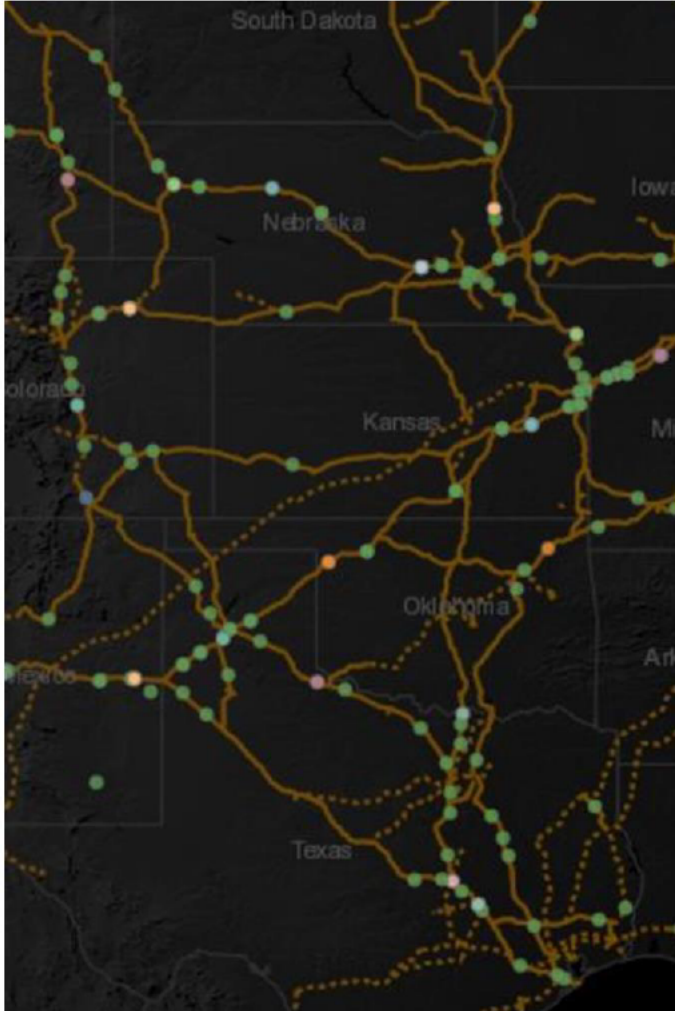


- Current State
  - Extended Haul inspection at Temple, TX and Alliance NE
- Future State
  - Eliminate inspection at Temple, TX
  - Extended Haul inspection in Alliance, NE
    - All CW defects setout and repaired in Alliance
  - Total manual inspection interval approximately 3,000 miles

*Loaded trip 1,516 train miles*



# Additional Technology Coverage



Detector	Count
HBD	53
WILD	3
WILD EDGE	1
THD	1
TPD	2
TGD	2
Cracked Wheel and Axle	2
Acoustic Bearing	1
MVS - Coupler Securement	1
MVS - Tread Inspection	2
MVS - Wheel Profile	1
MVS - Truck Inspection	2
MVS - Brake Shoe	1

Detector Map (HBD excluded, 30 mi spacing)

- Detector Coverage for additional safety support
  - Expanded technology and coverage
  - Severity based alerts and setouts
- Historical carmen find rate (defects/car inspected)
  - Temple – 0.12%
  - Amarillo – 0.095%

# Next steps for coal expansion

- Request approval from test waiver committee and proceed for waiver expansion
- Begin training at locations and regions impacted
  - Signal, Mechanical and TY&E
  - Initial target locations – Denver, Alliance, Temple, Amarillo, Lincoln
  - Once completed, select train set family to begin waiver
    - Similar approach in the past, begin with small population and expand based on performance

## Potential Set Families

### Pikes Peak

- CEB/CXC/CNM/CLO/CEJ/OTL (37 sets)
- PCT/PEK/PFK/PKC (10 sets)
- MAS/SLC/RTR/NMA/SKS/OPP (16 sets)
- SFB/MHS/MHD/MHK (18 sets)
- MLM/THH/LRT (18 sets)

### Sandhills

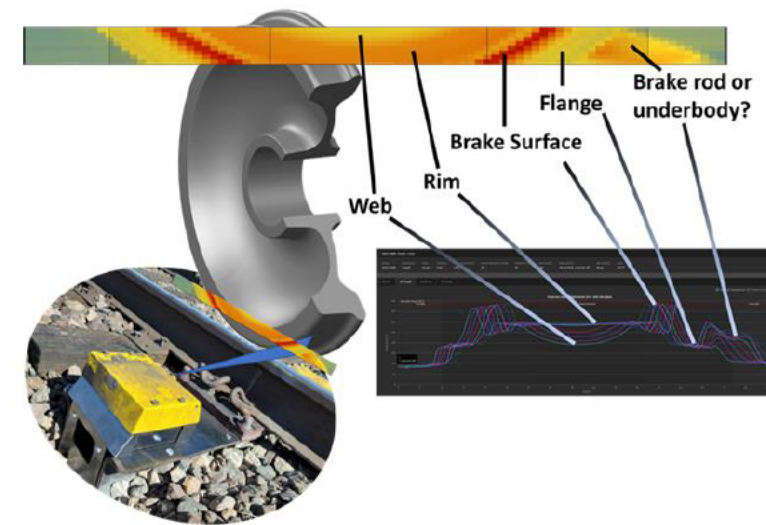
- SLP (12 sets)
- HAF (12 sets)
- DON (6 sets)

# Hardware Transitioning: PowerView to Phoenix

*Background: When BNSF developed its Brake Health Effectiveness (BHE) testing, the Progress Rail Services (PRS) PowerView Wheel Temperature Detector (WTD) was the best available technology. While favorable results have been achieved, BNSF's spirit of continuous improvement drove the team to monitor the marketplace for alternatives that would help mitigate several known issues.*

*The primary issues to be addressed included; lens exposure to environment (e.g. dust, frost) and heat saturation (common to pyrometer-based technologies). These intermittent issues introduced undesirable exposures into the process, often when weather conditions were less than desirable. (e.g. Signal Maintainers frequently dispatched to the sites to clean lens, Carmen inspections account inaccurate fail or no test results)*

*See below and right for additional Phoenix design features supporting the transition.*



Phoenix; features, capabilities and placement / orientation	Benefits
<p>The Phoenix scanner is;</p> <ul style="list-style-type: none"> <li>• Housed within a heated enclosure to prevent the accumulation of snow and ice;</li> <li>• Equipped with a protective shutter that is open only during train passes preventing debris from fowling the optics; and</li> <li>• Includes a spinning mirror that naturally expels debris that may enter the scanner case during train passes</li> </ul>	<p>Mitigates need for frequent trackside maintenance, thus reducing exposures encountered by maintenance technicians</p>
<p>Practically speaking, the Phoenix scanner has no high-end temperature limit</p> <ul style="list-style-type: none"> <li>• Current technology is limited to 253° f.</li> <li>• Overcoming the saturation issue</li> </ul>	<p>Improved measurement resolution prevents inaccurate no-test and fail results, thus reducing exposures associated to manual, no defect found inspections</p>
<p>The Phoenix scanner is;</p> <ul style="list-style-type: none"> <li>• Oriented / aimed perpendicular approximately 18" from the wheel plate, scanning the tread just above the rail head</li> <li>• In contrast, the PowerView (current technology) is aimed at an acute angle (almost parallel to the rail) with its lens approximately 7 – 8' away from the target wheel</li> </ul>	<p>Scanner proximity to the wheel reduces the influence posed by the environmental conditions (e.g. ambient temperature, rain, snow and blown debris), further reducing the need to frequently visit the site account false 'dirty scanner' alerts</p>

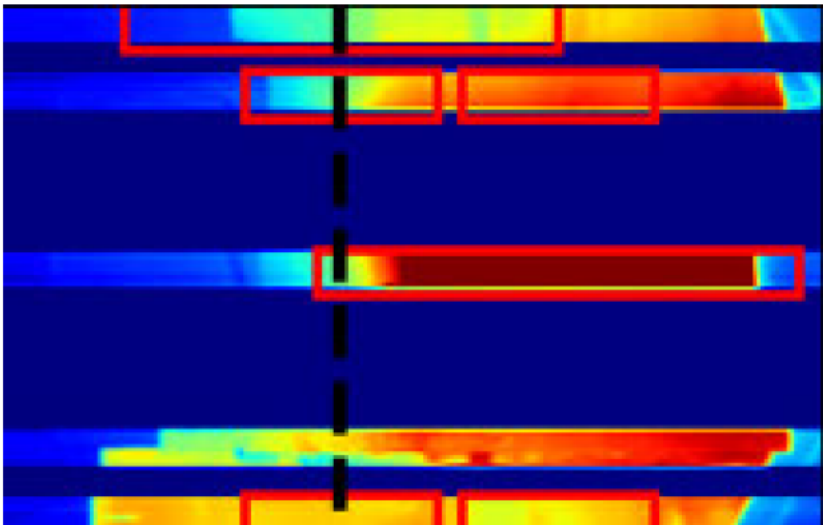


# In-Track Thermal Traction Motor Monitoring

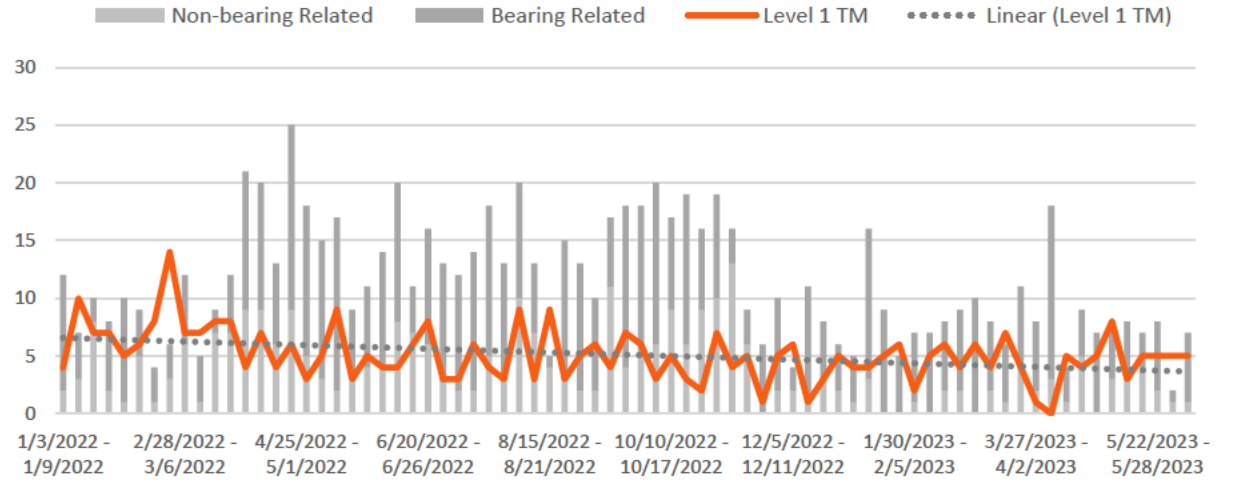
ITT Detector Site (14)



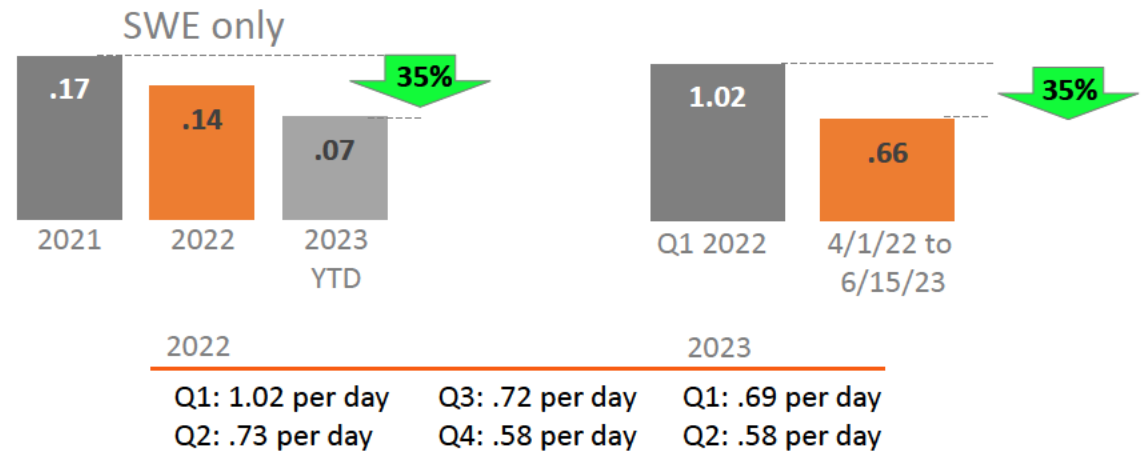
Traction Motor Heat Map



Action taken on ~900 units since tracking began



Level 1 traction motors per day



# PowerView Dirty Lens Vs Phoenix Readings

## PowerView Cold Wheel:

Even with a cleaning schedule that requires maintenance to clean the lenses multiple time a week, we see diminished temperature readings because of dirty scanner lenses.

(Note: There is a high percentage of "No Test" trains after rain, snow, and frost events.)



## Phoenix Cold Wheel:

The Phoenix Cold Wheel shows us good wheel temps after two months without cleaning maintenance.

(Note: We still see the same failed cars between the two Cold Wheel systems, but are less likely to false alarm based on dirty scanner issues.)



# BHE Site Moves

We are requesting to move a few BHE sites due to BNSF Operation Practice recommendations.



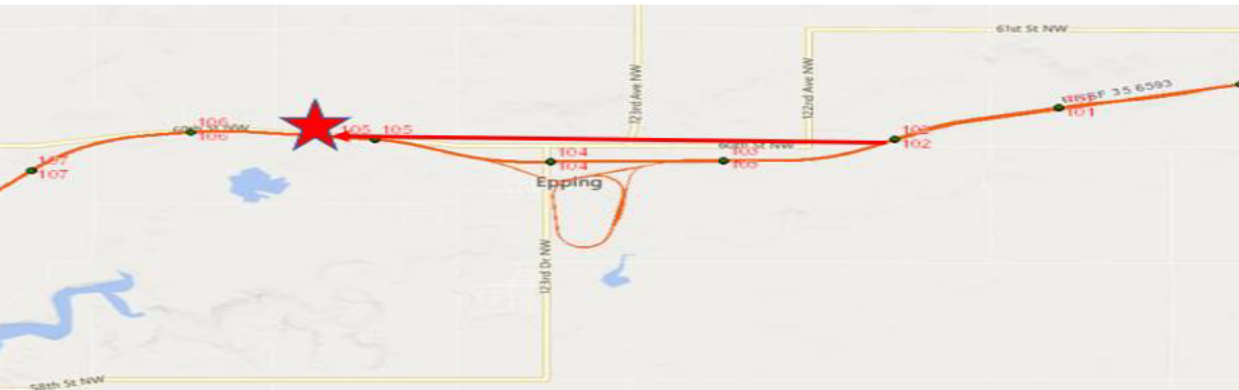
Non-Braking Site move from Mountainair, NM to Melrose, NM.

Reason: Trains regularly stop at Mountainair for Operations reasons.



Non-Braking Site From Java East, MT to Libby, MT.

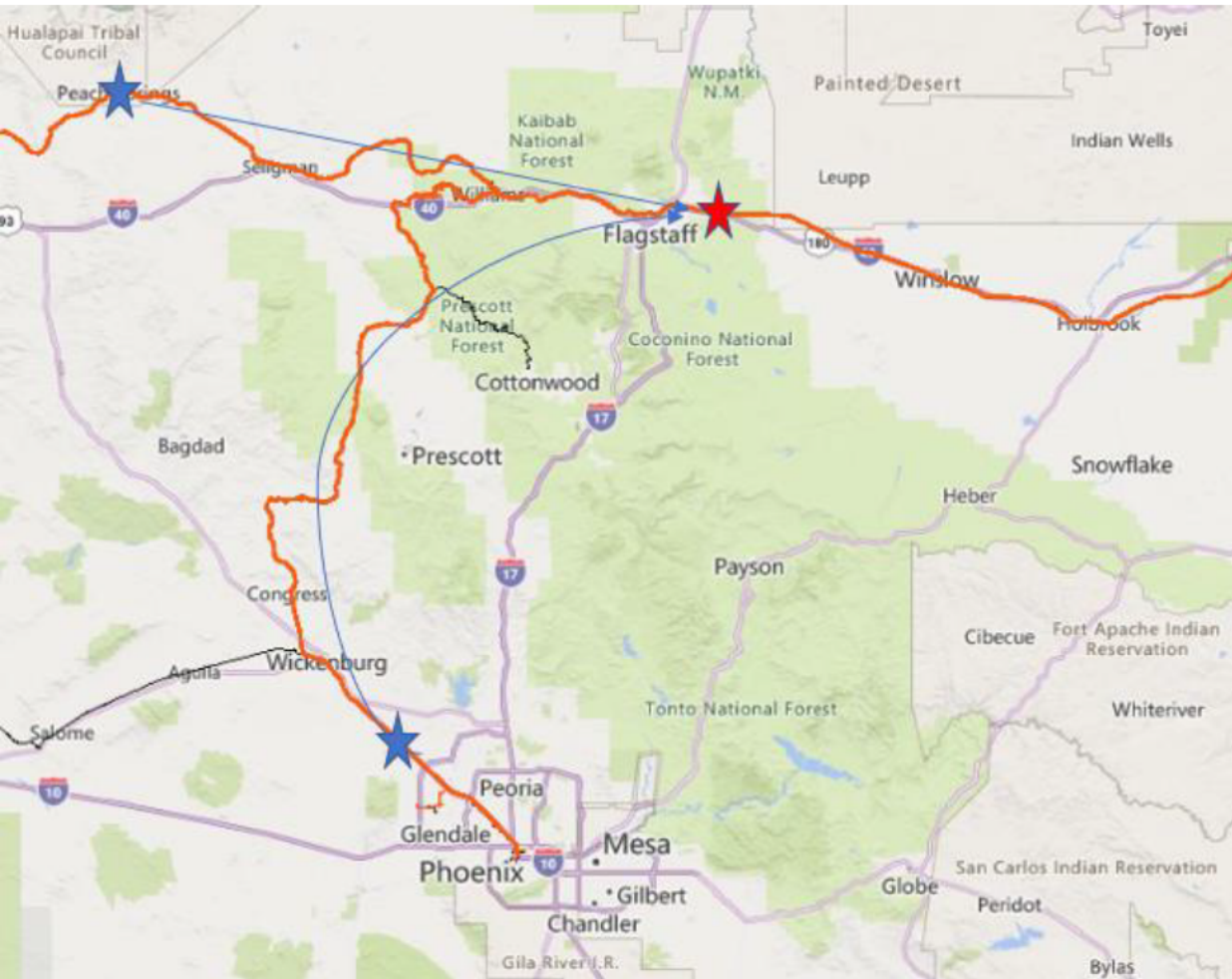
Braking Site From Spotted Robe, MT to Swamp Creek, MT



Braking Site From Epping 102.1 to Epping 105.2.



# BHE Site addition to Capture Phoenix Traffic to Chicago



Trains coming from Phoenix to Chicago are not traveling through the Non-Braking Site, Shipley based on location.

A new Non-Braking Site at Wittmann, AZ would capture the Non-Braking data. When the BHE train passes Angell, AZ Braking Site it would be able to have the comparison test from Non-Braking (Wittmann) to Braking (Angell).



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# Appendix

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August 18, 2021

**Resubmitted**  
Request to  
expand BHE to  
Coal Route



U.S. Department  
of Transportation

**Federal Railroad  
Administration**

VIA E-MAIL ONLY

August 25, 2021

Mr. Beau Price  
Director – Locomotives & Air Brakes  
BNSF Railway Company  
Beau.Price@bnsf.com

**Re: Docket Number FRA-2018-0049**

Dear Mr. Price:

This letter acknowledges the Federal Railroad Administration's (FRA) receipt of your request dated and received August 18, 2021. Your request seeks an expansion of a waiver of compliance from certain provisions of Title 49 Code of Federal Regulations 232, related to brake health effectiveness (BHE).

Your request retains its originally assigned docket number, FRA-2018-0049. All information contained in this and other dockets is available at [www.regulations.gov](http://www.regulations.gov).

FRA is reviewing your request in accordance with the requirements in Title 49 Code of Federal Regulations Part 211, Rules of Practice.

Sincerely,

A handwritten signature in black ink, appearing to read 'Karl Alexy'.

Karl Alexy  
Associate Administrator for Railroad Safety  
Chief Safety Officer

1200 New Jersey Avenue, SE  
Washington, DC 20590

**BNSF**  
RAILWAY

## Meeting Minutes from BHE Test Committee Meeting June 22<sup>nd</sup>, 2023

### Roll Call / Attendance:

- 38 participants

### Overview:

Beau Price, Director Locomotive & Air Brakes - Presented the background and walked through the prepared presentation: "**BHE Test Committee Quarterly Update 6 22 2023 Final**". The document provided a summary the performance of the BHE waiver from commencement through June 14<sup>th</sup>, 2023 and provided the background and information to consider the expansion of the waiver to coal trains. The additional requests for a vote included both the relocation of several detectors for reliability and maintainability concerns and the incorporation of new replacement detectors which have both improved performance and reduced maintenance requirements.

### Questions During Review of "BHE Test Committee Quarterly Update 6 22 2023 Final":

**Question #1** – Roman Chavez FRA, commented/requested that there might be a need to possibly re-train on using CMEH data to understand all pertinent information on cars to address at time of the ASCT.

**Response:** Matt Baldwin BNSF – We will review the guidance on CMEH in training program and send out notice to system (TTX & BNSF) of need to review CMEH data specifically for BHE Waiver. **Note:** Feedback also provided after the call by BNSF Field Superintendent Hakeem Broughton that one event in FRA District 7 was related to unique individual(s) making a bad choice to not use CMEH and the issue has been addressed.

**Question #2** – Steve Zuiderveen FRA – Inquired how the BHE Coal Program would be impacted by the possible limits in ability to handle volume of repairs in Alliance, Lincoln or other locations? (...like our limits in Intermodal at the LA Ports / Chicago Ramps)

**Response:** Matt Baldwin BNSF – While we will have limits on the volumes of cold wheels (CWs) we potentially could work in Alliance or Lincoln, unlike both the Southern and Northern Transcon routes where we are at the ports and off loading ramps we are "Prepared" with material, manpower and additional "fill" cars at these sites to do the additional work. Most locations were designed to accommodate the work or have had processes developed to handle the workload ... still a potential limit but nothing like Intermodal limits.

**Question #3** – Dan Chancellor BRC – Noted that the locations identified for doing the work on coal trains has changed compared to the initial request to expand into coal from 2021. He commented that the locations that were inactive at the time "Donkey Creek & Guernsey" are now locations where the work and ASCT could be performed. He asked that we clarify for the group.

**Response:** Matt Baldwin & Beau Price BNSF – Very good point and the letter to FRA will reflect the changes to current manpower & staffed locations. Alliance, Temple, Amarillo, Lincoln, Guernsey & Donkey Creek (Denver will be removed – Guernsey & Donkey Creek added)

**Question #4** – FRA Team, Dan Chancellor – Questions on whether we see any current or future concerns with the combining to waivers with the coal fleet when BHE is turned on.

**Response:** Beau Price BNSF – No real concerns as it would be very similar if not identical to current Intermodal and grain train program with respect to BHE as largely unit trains all under the same list of waivers and requiring carmen QMI inspections to even be in the waivers. As an example, we already have grain, intermodal and coal under the EH1702 waiver and it gets combined with our combo train waiver and BHE waiver (with grain and intermodal). So we do not see any issues at all with bringing in the coal fleet. BNSF though agrees that if there are any issues, we need to raise the concern quickly with the test committee to get out in front of any challenges. We want to keep things as transparent as possible to avoid any conflict or concerns as we start coal operations with BHE.

**Comment(s) From Committee Discussion:**

- Not certain of duration of comment period from Safety Board – Labor organizations support the expansion but whether 30 day or 60 day comment period up to the board
- FRA Safety Board having a partial meeting on Tuesday July 11<sup>th</sup> but not known if the BNSF petition to start coal program could be docketed by that time
- FRA Safety Board full meeting in August (no date provided)
- BNSF focused on getting program started earlier as we look to do BHE program repairs on selected trains (or train families – same utilities) prior to winter operations to start the data gathering phase which we know is seasonally impacted

**VOTING SESSION – Four Committee Votes Taken:**

1. Vote to continue current BHE testing for an additional 6 months – **Unanimous Approval**
  - a. BRC - Yes
  - b. BNSF – Yes
  - c. Other Rail Roads – Not in attendance
  - d. AAR – Yes
  - e. FRA – Yes
    - i. HQ – Fairbanks - Yes
    - ii. Region 4 Lodge – Yes
    - iii. Region 5 Moore – Yes
    - iv. Region 6 Lodge – Yes
    - v. Region 7 Chavez – Yes
    - vi. Region 8 Blackwell – Yes
  - f. Sharma & Associates – Yes
  - g. NYAB – Yes
  - h. Wabtec – Yes
  - i. TTX – Yes
  - j. BLET – Yes
  - k. Smart TD – Yes
  
2. Vote to approve expansion of BHE waiver program to include BNSF coal trains with a graduated plan based on utilities served and impacts to locations that will be addressing any CW defects and completing ASCT and necessary repairs – **Unanimous Approval.**
  - a. BRC - Yes
  - b. BNSF – Yes

- c. Other Rail Roads – NA
  - d. AAR – Yes
  - e. FRA – Yes
    - i. HQ – Fairbanks - Yes
    - ii. Region 4 Lodge – Yes
    - iii. Region 5 Moore – Yes
    - iv. Region 6 Lodge – Yes
    - v. Region 7 Chavez – Yes
    - vi. Region 8 Blackwell – Yes
  - f. Sharma & Associates – Yes
  - g. NYAB – Yes
  - h. Wabtec – Yes
  - i. TTX – Yes
  - j. BLET – Yes
  - k. Smart TD – Yes
3. New Technology Utilization – Replace existing “PowerView” detectors with fully tested new “Phoenix” detectors for reliability & maintainability – **Unanimous Approval.**
- a. BRC - Yes
  - b. BNSF – Yes
  - c. Other Rail Roads – NA
  - d. AAR – Yes
  - e. FRA – Yes
    - i. HQ – Fairbanks - Yes
    - ii. Region 4 Lodge – Yes
    - iii. Region 5 Moore – Yes
    - iv. Region 6 Lodge – Yes
    - v. Region 7 Chavez – Yes
    - vi. Region 8 Blackwell – Yes
  - f. Sharma & Associates – Yes
  - g. NYAB – Yes
  - h. Wabtec – Yes
  - i. TTX – Yes
  - j. BLET – Yes
  - k. Smart TD – Yes
4. Relocate several detector sites to improve reliability, reduce marginal reads and improve access and maintainability – **Unanimous Approval.**
- a. BRC - Yes
  - b. BNSF – Yes
  - c. Other Rail Roads – NA
  - d. AAR – Yes
  - e. FRA – Yes
    - i. HQ – Fairbanks - Yes
    - ii. Region 4 Lodge – Yes
    - iii. Region 5 Moore – Yes

- iv. Region 6 Lodge – Yes
- v. Region 7 Chavez – Yes
- vi. Region 8 Blackwell – Yes
- f. Sharma & Associates – Yes
- g. NYAB – Yes
- h. Wabtec – Yes
- i. TTX – Yes
- j. BLET – Yes
- k. Smart TD – Yes

Minutes prepared by Beau Price & completed on June 23<sup>rd</sup>, 2023 and sent to committee members for their review. Please let me know if you have any questions or changes.

Beau Price  
Director Locomotives & Air Brakes



**BHE Waiver Meeting Attendees**

<b>Waiver Meeting Attendee</b>	<b>Role</b>	<b>Organization</b>	<b>Email</b>	<b>5/10/2022</b>	<b>10/27/2022</b>	<b>6/22/2023</b>
Heath Bushell	AAR / BSC Manager	AAR		X	X	X
Aaron Ratledge	Railroad SME / Operating Practices	BNSF				X
Allen Beitel	Railroad SME / Mechanical	BNSF		X		X
Beau Price	Committee Manager / Railroad SME	BNSF		X	X	X
Rusty Booth	Railroad SME / Mechanical	BNSF			X	X
Ben Strot	Railroad SME / Operating Practices/Safety	BNSF				
Brandon Mabry	CMO	BNSF				
Duke Remington	Railroad SME / Operating Practices	BNSF		X		X
Gretta Baker	Service Design	BNSF		X	X	X
Hark Braren	Railroad SME / Detector Technology	BNSF			X	X
Jack Murray	Railroad SME / Field Mechanical	BNSF				
Jim Nelson	Railroad SME / Field Mechanical	BNSF				X
Joe Kerber	Railroad SME / Mechanical & IT Support	BNSF				
Keary Walls	Railroad SME / Transportation	BNSF				
Larry Stover	Railroad SME / Mechanical TWI Supt.	BNSF				
Landon Boggs	Railroad SME / Transportation Supt. MT	BNSF				
Luke Johnson	Railroad SME / Transportation Gen Dir MT	BNSF				
Landon Smith	Railroad SME / Technology Services	BNSF				
Mark Schulze	VP Safety	BNSF				X
Matt Baldwin	Railroad SME / Mechanical	BNSF		X	X	X
Matt Garland	Railroad SME / Transportation & Dispatching	BNSF				
Ryan Louquet	Railroad SME / Detectors & Cars	BNSF		X	X	X
Sara Johnson	Railroad SME / Transportation & Dispatching	BNSF				
Sherwin Hudson	Railroad SME / Field Mechanical	BNSF				
Shawn Ball	Railroad SME / Field Mechanical	BNSF				
Dan Chancellor	Labor Representative	BRC		X	X	X
Darrin Trieber	Labor Representative	BRC		X	X	X
Kelly Portlock	Labor Signal Maintainers	BRSM				
Tim Healey	Railroad SME / BSC Member	CSX				
Ken Werres		FRA				
Charles King		FRA		X	X	X
Zac Biagtan		FRA - 8		X	X	
Steve Zuiderveen	Test Monitor	FRA - DC		X	X	X
Gary Fairbanks	Test Oversight	FRA - DC		X	X	X
Michael "Mick" Lodge	Test Oversight	FRA Region 4		X	X	X
Michael Bodoh	Test Oversight	FRA Region 4				
Stewart, Monique	Test Oversight	FRA Region 5				
Kris Moore	Test Oversight	FRA Region 5		X	X	X
Vence Haggard	Test Oversight	FRA Region 5		X		X
Dan Lucero	Field Inspector	FRA Region 5			X	X
Pat Merritt	Field Inspector	FRA Region 6				
Roman Chavez	Field Inspector	FRA Region 7		X	X	X
Mike Blackwell	Field Inspector	FRA Region 8		X		X
Hector Hidalgo	Railroad SME /	KCS				
Michael Parisian	Brake System SME / BSC Member	NYAB		X		X
Matt Radovich	FRA Research & Development	Sharma - Associates			X	
Som Singh	FRA Research & Development	Sharma - Associates		X	X	X
Gray Booth	FRA Research & Development	Sharma - Associates		X	X	
Feliz Castillo	Car Owner / SME Car Repair Process	TTX				
Mike Hansen	Car Owner / SME Car Repair Process	TTX		X		X
Morine Warner	Car Owner / SME Car Repair Process	TTX			X	X
Ryan Miller	Car Owner / SME Car Repair Process	TTX				
Bill Sheesley	Railroad SME / BSC Member	UP		X	X	
Aldron McKinney	Labor Representative	UTU/BLET		X	X	X
Jason Manley	Labor Representative	UTU/BLET		X	X	X
Ed Gaughan	Brake System SME / BSC Member	Wabtec		X	X	X
Kyle Mulligan	CP	CP				
John Killoy	FRA	FRA				
Don Grissom	Asst Gen Pres Brotherhood Carmen				X	
Brett Bridges	Alliance Supt	BNSF				X
Brett Winfree		BNSF				
Michael Lechuga	GF 3 Commerce	BNSF				
Ken Johnson	Denver Inspector	FRA		X		
Doug Jones		BNSF				
Ron Hynes	AAR	AAR				
Jeff Garrels	Gen Director Operating Practices	BNSF				
David McCann	Supt II Transportation	BNSF				
Hakeem Broughton	Supt California	BNSF		X	X	X
David Miller	Supt Southwest	BNSF				X
Jason Rounds		BNSF		X		X
Randee Huffman	Manager	BNSF		X		
Justin Johnson		BNSF			X	X
James Williams		BNSF			X	
Edmundo Rodriguez	Chief Mechanical Officer	BNSF				X
Abid Raza	Gen Dir Loco Maintenance	BNSF				X
Isaac Skinner	Supt Safety and Operating Practices	BNSF				X
Sean Vosahlo	GF 2 Nebraska	BNSF				X