2020 Railroad Emergency Response & Hazardous Materials Awareness

BNSFHAZMAT

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Section I: Introduction to Railroads and Hazardous Materials

Railroad Emergency Response & Hazardous Materials Awareness

Who and What We Are.....





- 32,500 Miles of Track,36,000+ employees
- Operating in 28 States,
 3 Canadian Provinces
- > Over **8,000** Locomotives
- Operating approximately 1,200 trains per day
- > 2020– 1.5 Million Hazardous Material Shipments
- 2021 Capital Investment of \$2.99 Billion

BNSF can move 1-ton of freight approximately 500 miles on 1-gallon of fuel

BNSF HazMat Shipments



















Top 20 HazMat's Transported by BNSF in Tank Cars

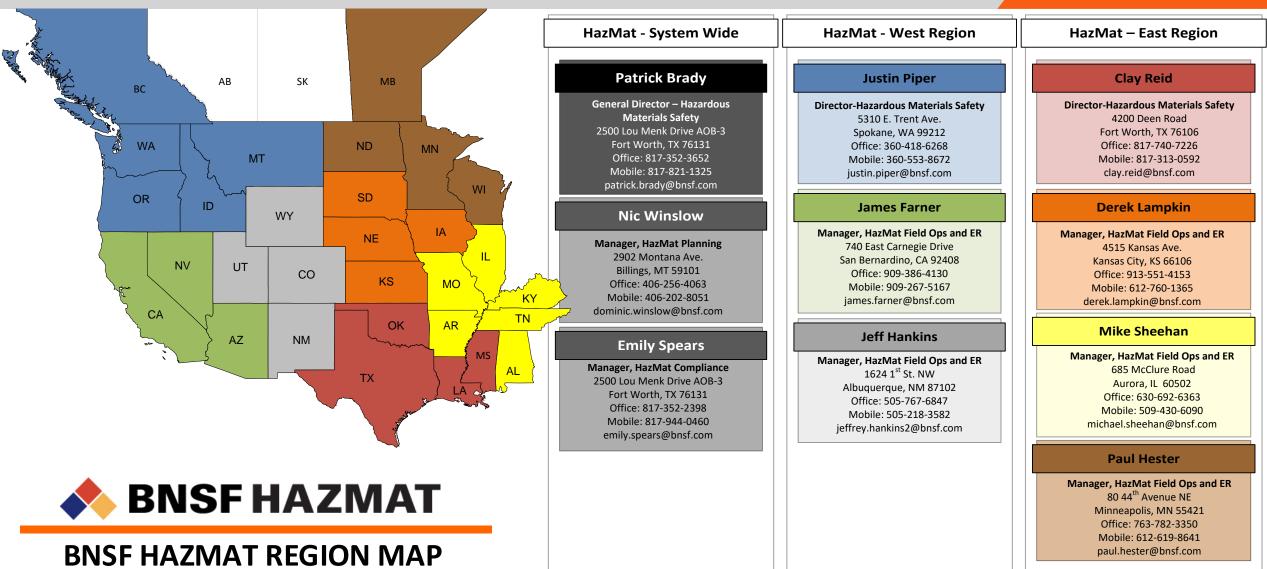
(EOY 2020)

UN ID#	Haz Class	Proper Shipping Name	ERG	ResidueCar	LoadedCar
1267/3494	3	PETROLEUM CRUDE OIL	128	175987	165512
3475/1170/1787	3	ETHANOL AND GASOLINE MIXTURE	127	112968	115075
3257	9	ELEVATED TEMPERATURE LIQUID, N.O.S.	128	40262	41542
1203	3	GASOLINE	128	34913	25322
1993/1202	CL	DIESEL FUEL	128	16713	15497
1824	8	SODIUM HYDROXIDE SOLUTION	154	10966	10597
1830	8	SULFURIC ACID	137	10081	10262
1789	8	HYDROCHLORIC ACID	157	7612	6755
1805	8	PHOSPHORIC ACID SOLUTION	154	5132	5087
1230	3	METHANOL	131	4896	4321
1268	3	PETROLEUM DISTILLATES, N.O.S.	128	5337	4265
2055	3	STYRENE MONOMER, STABILIZED	128	3827	3801
2448	9	SULFUR, MOLTEN	133	3683	3792
3256	3	ELEVATED TEMPERATURE, LIQUID, FLAMMABLE, N.O.S.	128	2908	3077
1301	3	VINYL ACETATE, STABILIZED	129	2264	2795
1814	8	POTASSIUM HYDROXIDE, SOLUTION	154	2417	2523
2426	5.1	AMMONIUM NITRATE, LIQUID	140	2574	2464
1017	2.3	CHLORINE	124	2506	2444
3082	9	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.	171	1920	2363
2187	2.2	CARBON DIOXIDE, REFRIGERATED LIQUID	120	2286	2195

72% of total bulk shipments

HAZMAT Region Map





•5

Training - Community

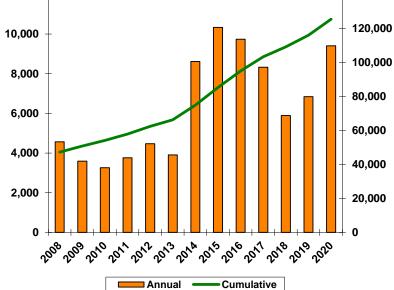


Community focus is on training responders and providing interpretative information for a safe response.

Community Training:

- Over 125,000 First Responders Trained since 1996
- In person training with or w/out Training Rail cars
- > Web Based Training via BNSFHAZMAT.com
- > Webinars

12,000



Number of Responders Trained

140,000







BNSF Hazardous Material Stats



2,000,000 1,800,000 1,600,000 140 35 1,400,000 120 30 25 1,200,000 100 Non-Accident 20 80 Accident 1,000,000 60 15 800,000 40 10 600,000 20 5 400,000 0 0 200,000 0 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 — AR ----NAR

HAZMAT TRENDS 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 Accident Release (AR) 8 15 24 2 30 7 3 14 4 12 Yearly Totals Number of Derailments 5 2 6 3 4 6 7 4 2 6 with an AR AR per 100 KHM 0.71 1.04 1.35 0.11 1.75 0.51 0.22 0.92 0.25 0.82 Shipments Non Accident Release 96 99 129 114 127 105 96 122 79 69 (NAR) Yearly Totals NAR per 100KHM 8.5 6.9 7.3 6.2 7.4 7.7 7.2 8.1 4.9 4.7 Shipments

BNSF Number of Hazmat Shipments

BNSF Total Hazmat Releases



Section II: Working Around Railroads and Equipment

Railroad Emergency Response & Hazardous Materials Awareness

Working Around Railroads and Equipment



Personnel Safety –

- <u>Keep your head on a swivel!!!!!</u>
- NEVER step ON a rail. Step OVER a rail. This is a major slip, trip, and fall hazard.
- NEVER stand BETWEEN the rails.
- If it is necessary to climb on rail equipment, remember to maintain three points of contact at all times. Rail equipment ladders often curve around the profile of the car, and the first step up is a long way off the ground. When stepping down from the last rung, DO NOT jump. A good plan is to use your own ladders. Block the feet, and tie them off at the top of the car or equipment.
- Locomotive steps should be considered ladders. Always face the equipment going up and down, and maintain three points of contact.
- Locomotives in rail yards may be operated via remote control. NO crew to see you!

Working Around Railroads and Equipment

BINSF

Incident Scene Safety -

- Contact the railroad dispatching center, and report your emergency. Advise if train traffic needs to be stopped.
- Identify yourself, your agency, your city/state, and location.
- Report all emergencies including stalled vehicles, grass fires, structural fires, and medical emergencies near or on railroad tracks.
- If you are at a derailment scene, beware of tipped and leaning equipment. Be especially aware of bent and stressed rail which can suddenly move and lash out. As the clearing operations begin, watch out for heavy equipment such as bulldozers and loaders.
- When responding to any rail emergency, remember that rail equipment is very large, and does hang out over the edge of the track. Always park your vehicles <u>AT</u> <u>LEAST 25 FEET</u> out from the edge of any track.
- Use railroad milepost numbers and/or railroad-highway crossing DOT Numbers

The Emergency Phone Number for BNSF Railway is 1-800-832-5452

Why you don't Foul our Track.....





The Aftermath.....







How do You Know Who's Track it is?

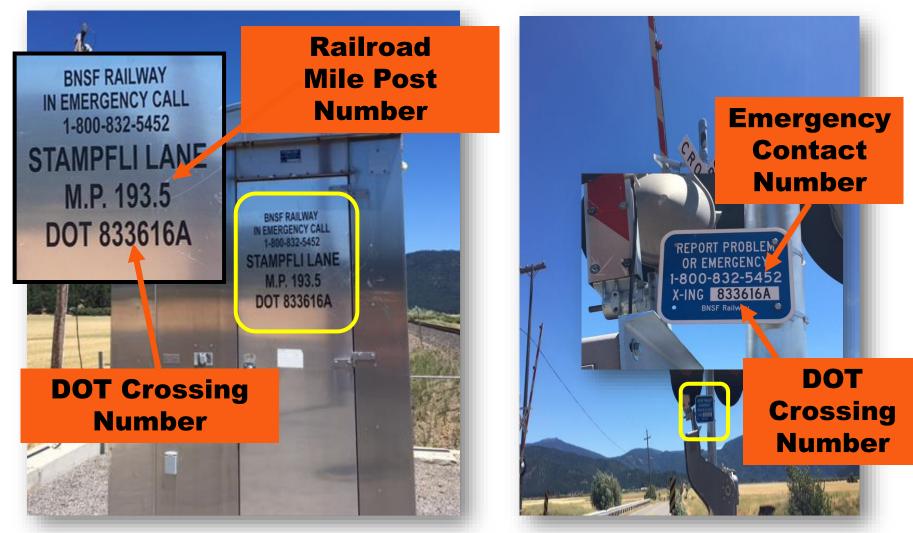




Rail Crossing Information



Call the railroad and report your location and situation.



Information at Your Finger Tips



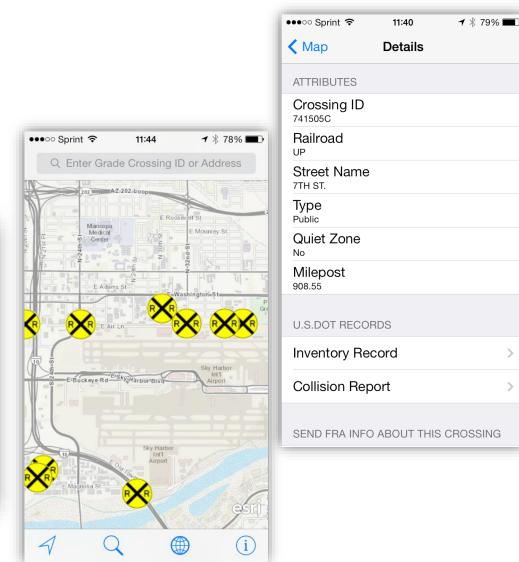
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Rail Crossing Locator (FRA)

- iOS and Android Devices
- Emergency Notification
- Railroad Owner
- Crossing ID
- Milepost
- Speed Limits
- Collision Reports





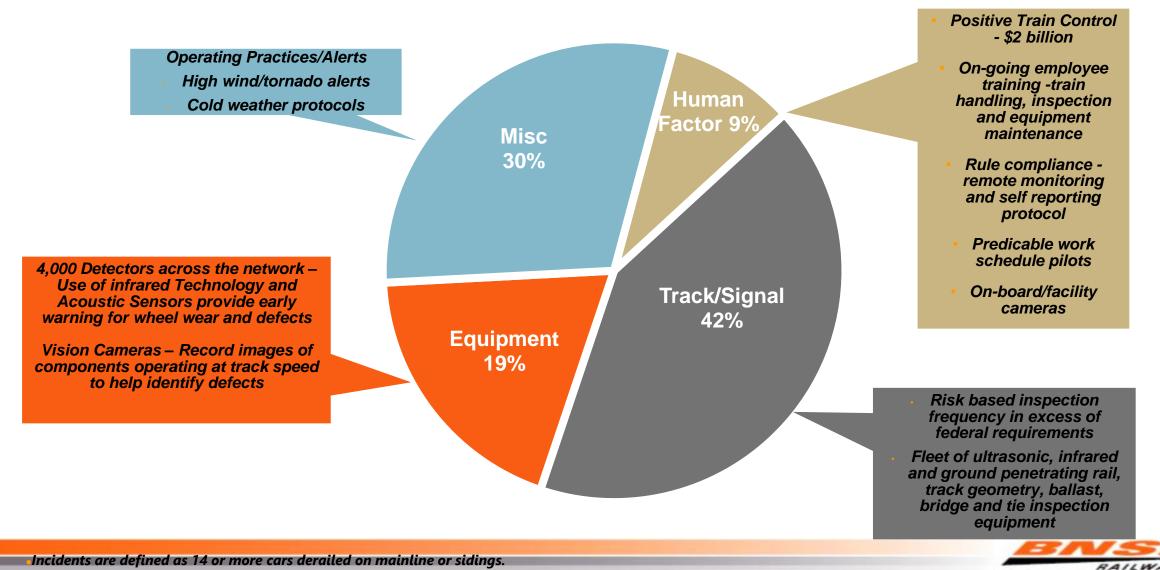


Section III: Assessing a Railroad Incident and Incident Command

Railroad Emergency Response & Hazardous Materials Awareness

BNSF Incident Profile and Response





•Source: FRA 3.18 Accident by State/Railroad Data for 2011-Jul 31, 2020

Prevention: Reducing Risk



Human Factor

- Training
 - Positive Train Control
- Remote monitoring Self reporting protocol

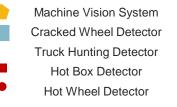
Equipment/Mechanical

- Ultrasonic inspection detectors
- Dragging equipment detectors
- Thermal/infrared scanning for warm bearing detection

Track/Signal

- Enhanced track inspection training
- Continued elimination of jointed rail
- Strong capital program for tie renewal
- Technology ground penetrating radar and enhanced geometry testing

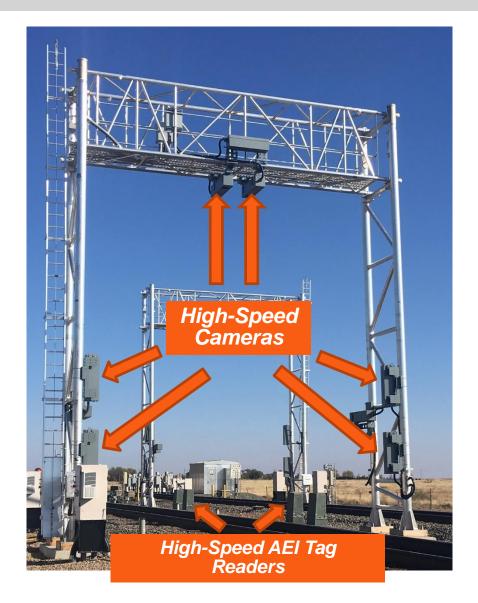




Optical Geometry Detector Acoustic Bearing Detector Cold Wheel Detector Wheel Impact Load Detector Truck Performance Detector

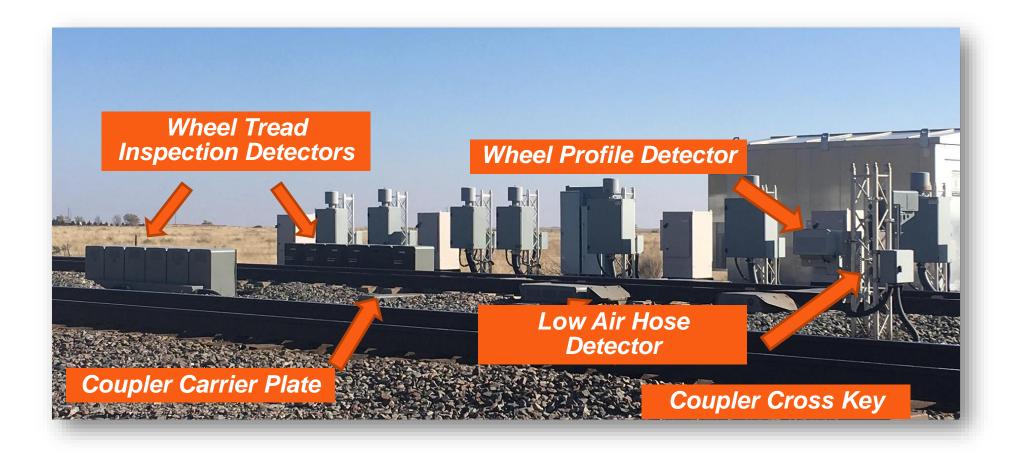
Train Inspection Portal (TIP)





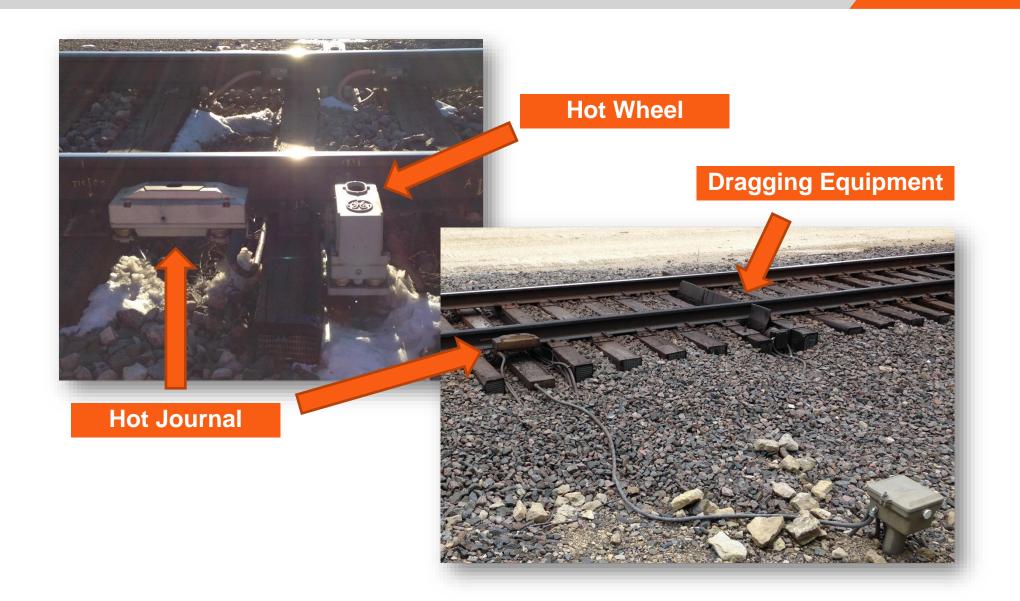
Detectors





Detectors

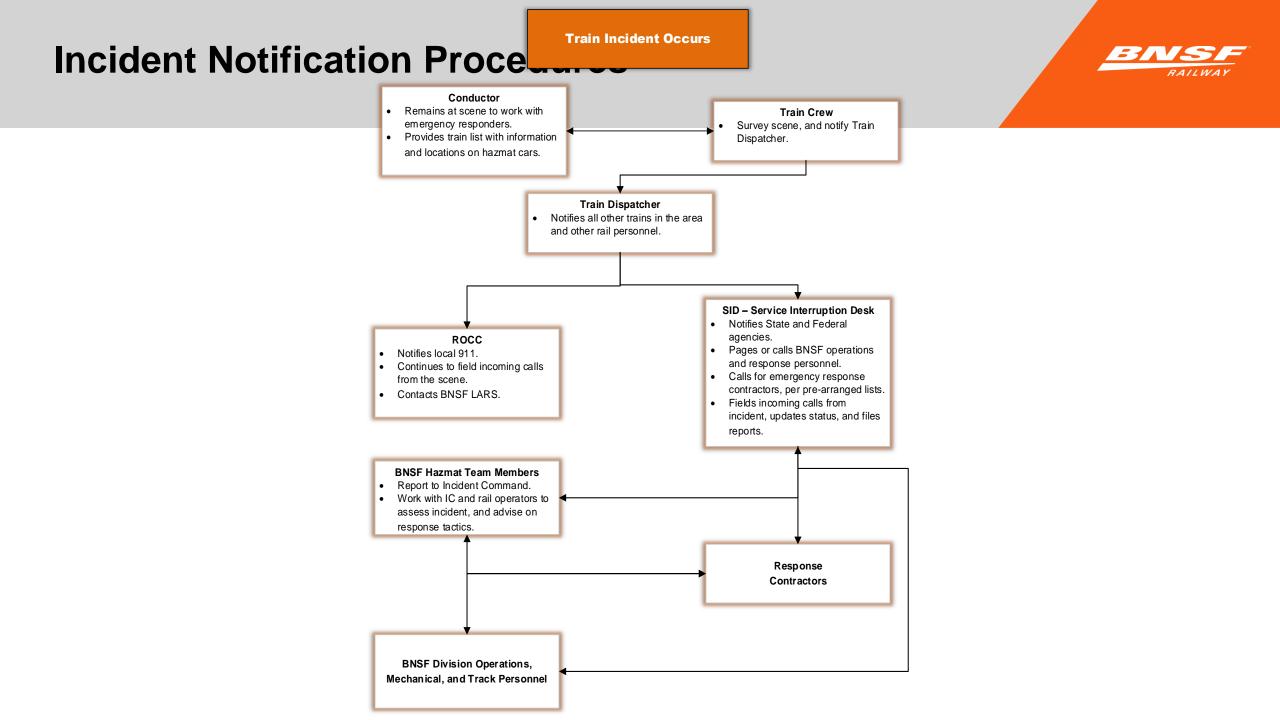




Network Operations Center







ICS and NIMS



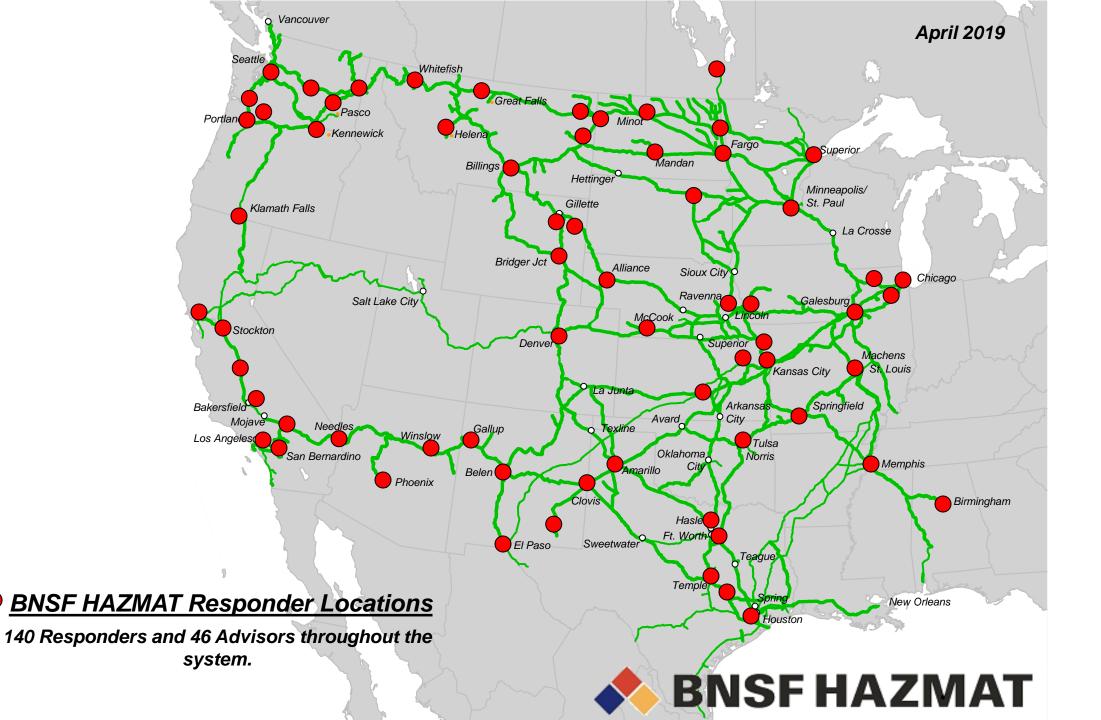
BNSF hazardous material responders, operations supervisors and train crews will work within the Unified Incident Command



Resources Coming to the Scene...







Railroad Resources



Environmental Table of Contents **Real Estate** Environmental/Hazmat Bing Road Engineering Hydrology WISCONSIN Natural Resources SOUTH DAKO Cultural Resources IDAHO Milwaukee MICHIGAN SocioEconomic Resources NEW YORK New Yor OHIO PENNSYLVANIA INDIANA NOIS Columbus Indianapolis WEST VIRGINIA VIRGINIA KENTUCKY Nashville NORTH CAROLINA ENNESSEE Charlotte Atlanta **ArcGIS Online Contents** SOUTH CAROLINA Predefined Views GEORGIA ABAMA MISSISSIPPI Environmental Incident Site Plan CHIHUAHI Tallahasse Jacksonville BAJA Response Equipment SONORA CALIFORNIA Hydrology / Strategies Hermosille FLORIDA Clear All Chibuahu Tampa COAHUILA DIOCO 47 7/ED Lan. 00 4/E

Geographical Information System - G.I.S.

Rail infrastructure, roads, pipelines, soils, streams, schools, hospitals, wetlands, 3-D Plume modeling.

What is Your Size-Up?





Where do you Start?





What do you See?





Safety First!



Hazards at a derailment are not always chemical.

What do you see here





Section IV: Product Identification

Railroad Emergency Response & Hazardous Materials Awareness

Do a Good Size-Up!



Start Gathering Information:

- What are your wind and weather conditions?
- Any smoke or vapor visible?
- Any liquids or leaks visible?
- What can the train crew or rail personnel tell you?
- What kind of rail cars do you see?
- Standing Car Reporting Marks (License Plate)?











The shipping papers (train list) are your #1 source for specific information concerning what is on the train

Hazardous Materials Shipping Papers



Find the train crew!

- The conductor will have the most complete train list immediately available to you.
- Never trust paperwork found lying around on the floor of the locomotive or in an unoccupied caboose.
- All responding railroad officials should have copies of the train list or paperwork.
- If the train crew is disabled and unable to provide paperwork call the railroad 800 number!





Railcar Markings



Markings on railcars are made up of three categories:

- Identification Numbers
- Commodity Names
- Hazard Warnings

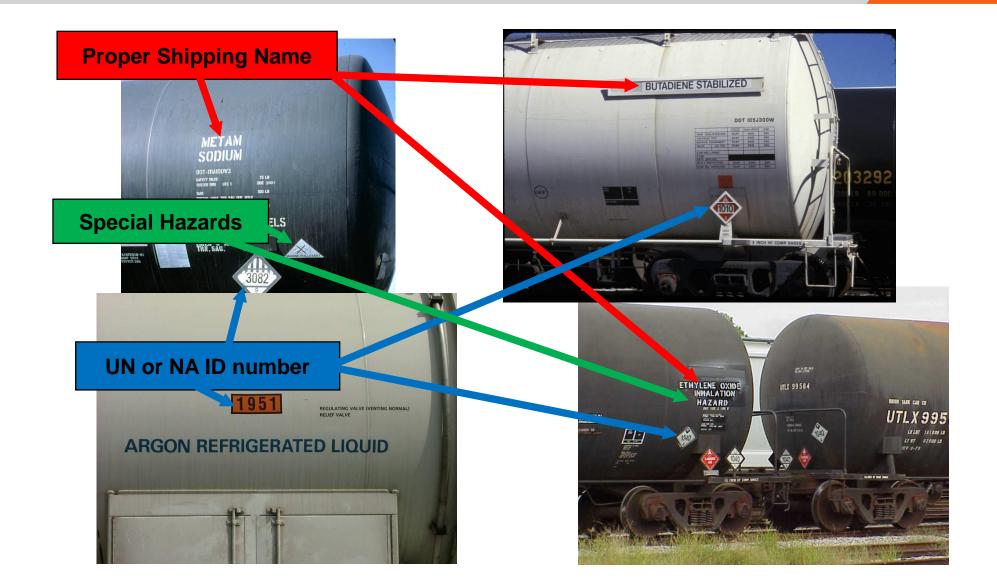
Reporting Marks (aka - License Plate)





Tank Cars may have Additional Markings





Not Official Markings





Not Official Markings





Train List / Consist



Power Header (locomotives)	EXAMPLE - MANIFEST TRAIN LIST **** Train Documents ****				
	Train H KCKBAR1 29A Passed MAINE AZ 1/29/11 1225 2 hr 10 min Ahead Head End Dyn Evt 2Wy Cum Loco OnlineIsolated Locos HP Av1HP Brk Rec ETD Axl Tons Dir Destin Cd From To				
	BNSF4981440044008 EF+YY6210WESTBARSCANBNSF1069440044008 EF+YN12196EASTBARSCANBNSF5352440044008 EF+YN18210EASTBARSCANBNSF7356440044008 EF+YN18210WESTBARSCANTotal176001760024826Actual HPT = 2.3(17600 HP / 7786 tons)InclDPUs1760017600Scheduled HPT = 1.818				
Train List starts	SeqCar LContentsOnlineJGrsFinalDestCurNumInitNumberKnd EWant DyDestinTRAJPTonConsigneeCitySTAxle				
here	1 BNSF 512019 GO5 L SHAPES LOSANG 94 IMMLERSTEEL LOSANG CA 28 NP NO PLACARDS REQUIRED				
	2 CGLX 582069 C5P L PLASTC LOSANG LAJ 127 LESBRO LOSANG CA 32 ER RETURN EMPTY VIA REVERSE ROUTE				
	3 NAHX 550932 C5P L AGGRGT LOSANG 127 AKZOCHM LOSANG CA 30 LV LOADED TO FULL VISIBLE CAPACITY BN IF BAD ORDER NOTIFY SHIPPER				
	4 NAHX 550341 C5P L AGGRGT LOSANG 132 AKZOCHM LOSANG CA 40 LV LOADED TO FULL VISIBLE CAPACITY BN IF BAD ORDER NOTIFY SHIPPER				
	5 KCS 152471 N55 L PRTPPR LAMIRA 107 CALFODISC LAMIRADA CA 4 6 BNSF 99911 T5H L HAZMAT LAMIRA 129 PLASTICHEM LAMIRADA CA 44 FL FLAMMABLE				

Page 25	***************************************				

DOT Special Permit



- Train crews are required to have a document that lists the current standing order of the train and all the regulatory required hazardous materials (Hazmat) information
- Historically, this document must be paper
- On April 13, 2020 BNSF received authorization to use electronic means via an IPad to comply with this requirement

	Department 1200 New Jenue & E sportation Vewington, D.C. 2016
	line and Hazardous riale Safety Administration
	DOT-SP 20954
	EXPIRATION DATE: 2021-09-30
	(FOR RENEWAL, SEE 49 CFR § 107.109)
ι.	GRANTEE: BNSF Railway Company Fort Worth, TX
2.	PURPOSE AND LIMITATION:
	a. This special permit authorizes the use of electronic means to maintain and communicate on-board train consist
	means to maintain and communicate on-board train consist and shipping paper information in lieu of paper documentation when hasardous materials are transported by rail. This special permit provides no relief from the Hasardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision
	<pre>means to maintain and communicate on-board train consist and shipping paper information in lieu of paper documentation when hasardous materials are transported by rail. This special permit provides no relief from the Hazardous Materials Regulations (HNR) other than as specifically stated herein. The most recent revision supersedes all previous revisions.</pre> b. The safety analyses performed in the development of this special permit only considered the hazards and risks
	 means to maintain and communicate on-board train consist and shipping paper information in lieu of paper documentation when hasardous materials are transported by rail. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision supersedes all previous revisions. b. The safety analyses performed in the development of this special permit only considered the hazards and risks associated with the transportation in commerce. c. Unless otherwise stated herein, this special permit consists of the special permit authorization letter issued

Why the change?

- Allows our train crews to depart on their train without having to enter a BNSF office to pick up a paper train list. This will minimize our crews potential exposure to COVID19
- Through the use of our electronic Mobile Train Reporting IPad application, train crews can update their train list in real time so the information available to first responders will be more accurate
- Electronic documents will be more beneficial to responders





During an Emergency How Can Responders Get Hazmat Information for a Train?

- There are several ways for responders to obtain this important information, including:
 - ASKRAIL
 - Getting information directly from the train crew
 - Calling BNSF's Resource Operations
 Communication Center (ROCC) 800-832-5452





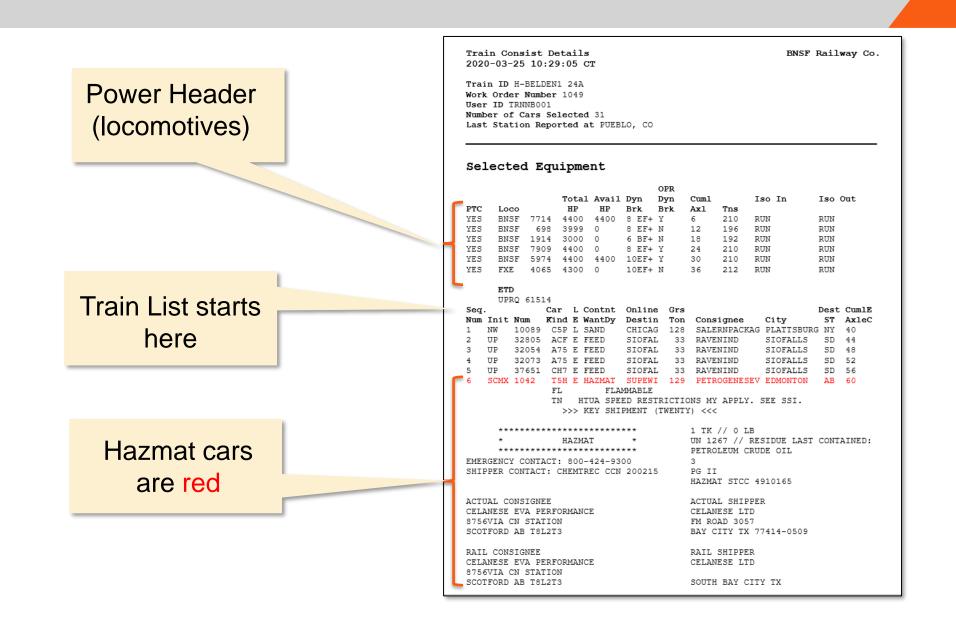
Getting Hazmat and Train List Information Directly from the Train Crew

BNSF Train Crew are instructed to share hazmat and train list information with first responders. This can be done from the incident using the following methods:

- Emailing the information directly to a responder. Responder can then access the information via their phone or laptop and share it with other responders
- Air Dropping, via Bluetooth, the information directly to a responders phone or tablet when no cell service is available in the area
- Train crew can share the information directly from their iPad with the responders



Getting Hazmat and Train List Information Directly from the Train Crew

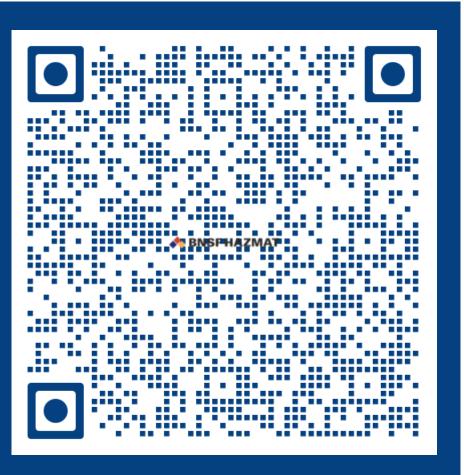




Getting Hazmat and Train List Information Directly from the Train Crew

RAILWA

- QR Code provides an example of a BNSF Electronic list that would be emailed to first responders
- The cars on this list are also active "training cars" in ASKRAIL



Electronic Train List

*****Asterisks***** Mean HazMat Shipment!



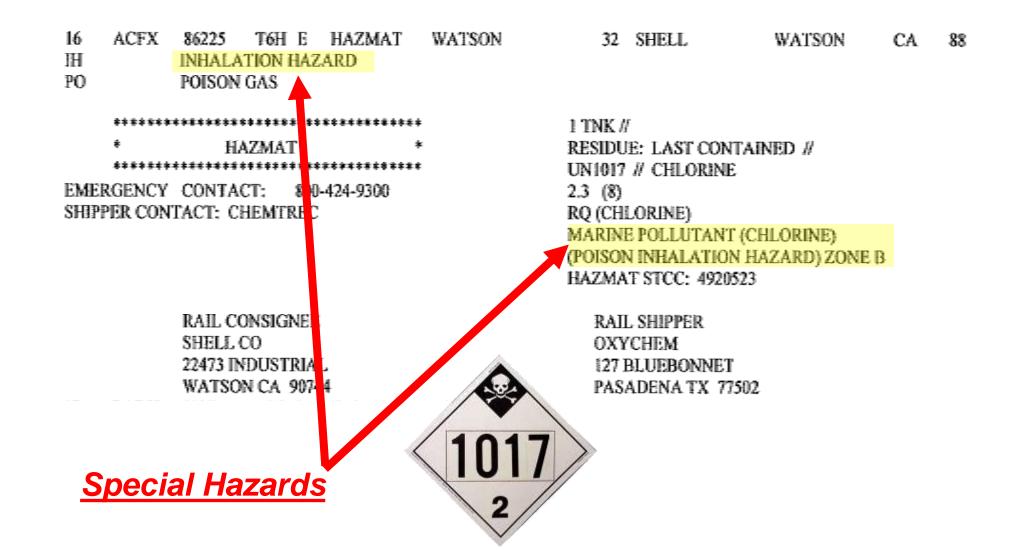
TC COMPLIES WITH CURRENT TANKCAR BUILD SPE	TCATI
	IGRE LOSANGELE CA 246
TN HTUA SPEED RESTRICTION MAY APPLY. SEE S	
	IGRE LOSANGELE CA 250
HazMat 58 STSX 61014 T4F L CRNSYR WCOLTONCA UP 141 TATELYN TN HTUA SPEED RESTRICTION MAY APPLY. SEE S	
59 ADMX 15809 T97 L GLYCOL SANFESPRICA 106 BRENNT	IFI SANFESPRI CA 254
shipment	
60 ADMX 17374 T97 L GLYCOL VALVERDECA 101 AOCLLC	PERRIS CA 258
TN HTUA SPEED RESTRICTION MAY APPLY. SEE S	
61 TILX 197298 TDI L HAZMAT STOCKTONCA CCT 135 KINERG	STOCKTON CA 262
FL FLAMMABLE	
TN HTUA SPEED RESTRICTION MAY APPLY. SEE S	
>>> KEY SHIPMENT (TWENTY) <<<	

**************************************	7 GA

EMERGENCY CONTACT: 1-800-424-9300 PG II	et et al.
SHIPPER CONTACT: CHEMTREC/CCN10914 HAZMAT STCC 4	152
RAIL CONSIGNEE RAIL SHIPPER	
KINERGY HUSKER AG MARI	ING INC
400 CAPITAL MALL SUITE 2060	
STOCKTON CA 95206 BRESLAU NE	
62 SHPX 222958 T5I L HAZMAT STOCKTONCA CCT 136 KINERG	STOCKTON CA 266
FL FLAMMABLE	
TC COMPLIES WITH CURRENT TANKCAR BUILD SPEC	ICATI
TC COMPLIES WITH CURRENT TANKCAR BUILD SPEC	
	5 GA
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3 *************************************	
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	152
EMERGENCY CONTACT: 1-800-424-9300 FG II	152
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EMERGENCY CONTACT: 1-800-424-9300 PG II SHIPPER CONTACT: CHEMTREC/CCN10914 HAZMAT STCC 41 RAIL CONSIGNEE RAIL SHIPPER KINERGY HUSKER AG MARK 400 CAPITAL MALL	
EMERGENCY CONTACT: 1-800-424-9300 PG II SHIPPER CONTACT: CHEMTREC/CCN10914 HAZMAT STCC 41 RAIL CONSIGNEE RAIL SHIPPER KINERGY HUSKER AG MARK	

Example: Special Hazards





Crude Oil Train List





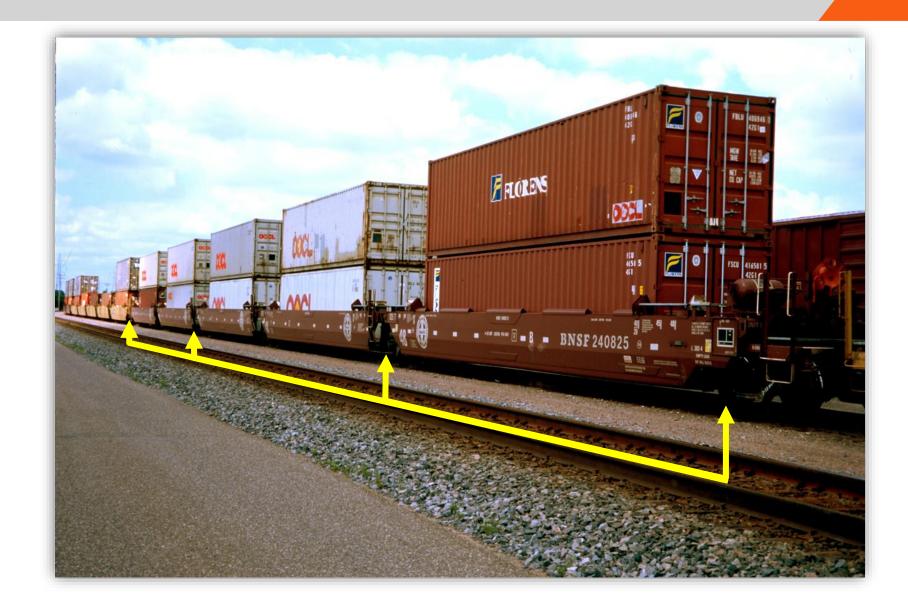
Example: Intermodal Train List

Typically there are multiple shipments in each trailer or container

Train Z ALT. Head End	LAC9 30A		d WICFA Dyn Ev		'X Cum		30/11 Loco	0844 0 Online	hr 24 min Ahe lsolated		
Locos		1HP	Brk Rec	ETD	Axl		Dir	Destin C	d From	То	
BNSF 7815			BEF+ Y	N	6			LOSANG Y			
BNSF 7880	4400 4	400 8	BEF+ Y	N	12			LOSANG Y			
BNSF 7209			BEF+ Y	N	18		WEST				
BNSF 7356			BEF+ Y	N	24		WEST	LOSANG Y			
		600			24	840		(1=(00 ND / /)	05.		
Incl DPUs	17600 17	600		Se		l HPT d HPT		(17600 HP/44	95 tons)		
Q	0		G	0.1			C		121	Dest	0
Seq Num Init N	umber Kno		Contents Want Dy	Online Destin	ј т		Grs	Consignee	Final City		Cum Axle
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G UPSU 2	95985 V	L	HAZMAT	PHOEN	[28T	UNITEDPARSEI	R PHOENIX	AZ	
NP N	NO PLACARI	DS REQ	UIRED								
*****	*******	******	******				1 PK	// 15 LT //	1		
*	HAZM	AT	*			U		// ETHANOL			
	*********					3					
EMERGENCY C			24-9300				GII				
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F	RAIL CONSIG	GNEE					RAIL	SHIPPER	_		
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	2345 GLENE							INDUSTRIAL			
F	PHOENIX AZ	85001					FT W	ORTH TX 76106			
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"One" Car = BNSF 240825



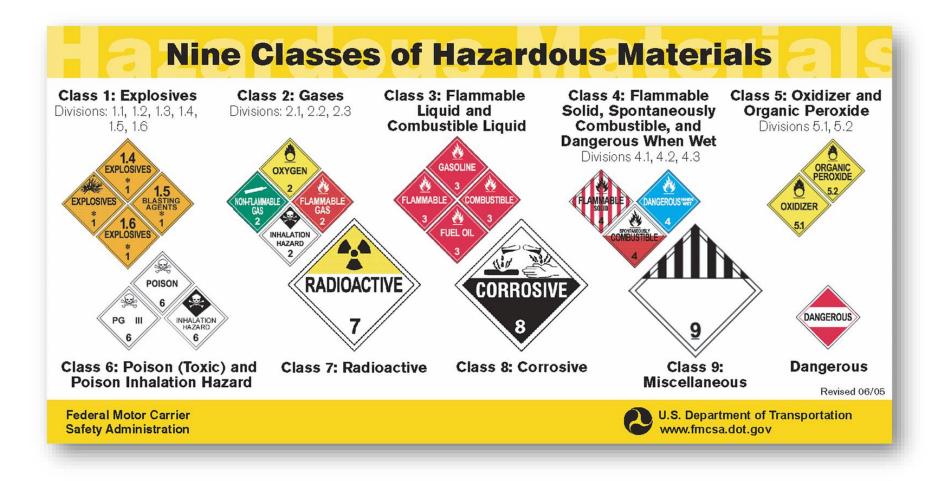


"One" Car with 10 Trailers or Containers



Placards and Hazard Classes





Dangerous

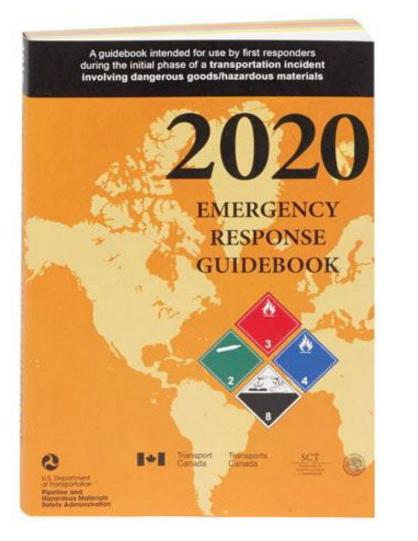




For mixed HazMat shipments of 1001 lbs or more Total Weight

HazMat Emergency Info





17 CARS FROM HEAD END BADX 1007 CLASSIFICATION: (NONFLAMMABLE GAS) EFFECTIVE 01 01 1983 EXPIRES 12 31 2050 COMMODITY NUMBER IS: 4904210 UNNA IS: UN1005 AMMONIA, ANHYDROUS <OR> AMMONIA SOLUTIONS (NONFLAMMABLE GAS) DIVISION 2.2 (NONFLAMMABLE GAS) <OR> DIV DIVISION 2.4 (CORROSIVE GAS) UN1005 (NONFLAMMABLE GAS) ENVIRONMENTALLY HAZARDOUS SUBSTANCE (RQ-100/45.4) (NONFLAMMABLE GAS) ANHYDROUS AMMONIA IS A CLEAR COLORLESS GAS WITH A CHARACTERISTIC ODOR. ALTHOUGH IT IS A NONFLAMMABLE GAS, IT WILL BURN WITHIN CERTAIN VAPOR CONCENTRATION LIMITS. AND THE FIRE HAZARD WILL INCREASE IN THE PRESENCE OF OIL OR OTHER COMBUSTIBLE MATERIALS. IT IS SHIPPED AS A LIQUID UNDER PRESSURE. CONTACT WITH THE LIQUID CAN CAUSE FROSTBITE. IT IS SOLUBLE IN WATER FORMING A CORROSIVE LIQUID. ALTHOUGH AMMONIA IS LIGHTER THAN AIR. THE VAPORS FROM A LEAK INITIALLY HUG THE GROUND. IT WEIGHS 6 LBS./GALLON. PROLONGED EXPOSURE OF THE CONTAINERS TO FIRE OR HEAT MAY RESULT IN THEIR VIOLENT RUPTURING AND ROCKETING. LONG TERM EXPOSURE TO LOW CONCENTRATIONS OR SHORT TERM EXPOSURE TO HIGH CONCENTRATIONS CAN RESULT IN ADVERSE HEALTH EFFECTS FROM INHALATION. IT IS USED AS A FERTILIZER, AS А REFRIGERANT, AND IN THE MANUFACTURE OF OTHER CHEMICALS. IF MATERIAL INVOLVED IN FIRE EXTINGUISH FIRE USING AGENT SUITABLE FOR TYPE OF SURROUNDING FIRE (MATERIAL ITSELF DOES NOT BURN OR BURNS WITH DIFFICULTY.) COOL ALL AFFECTED CONTAINERS WITH FLOODING QUANTITIES OF WATER APPLY WATER FROM AS FAR A DISTANCE AS POSSIBLE

Still Don't Know? Then AskRail!

- The AskRail mobile application serves emergency responders who arrive first to the scene of a rail emergency and need critical information about the contents of a railcar.
- This invitation-only mobile application provides immediate access to accurate, real-time data about individual railcars on a train. This data can help emergency responders make informed decisions about how to respond on the scene of a rail emergency.



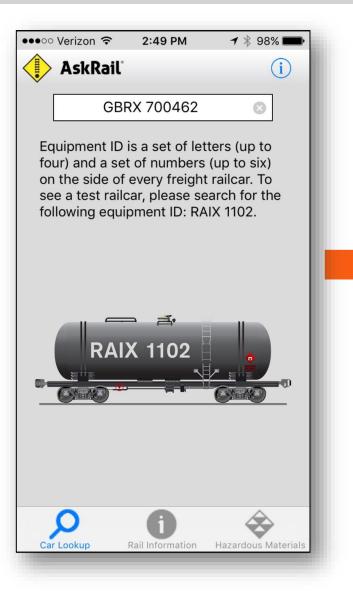


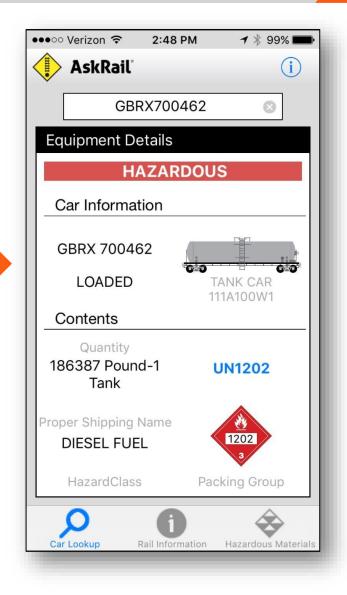






AskRail - Single Car Lookup







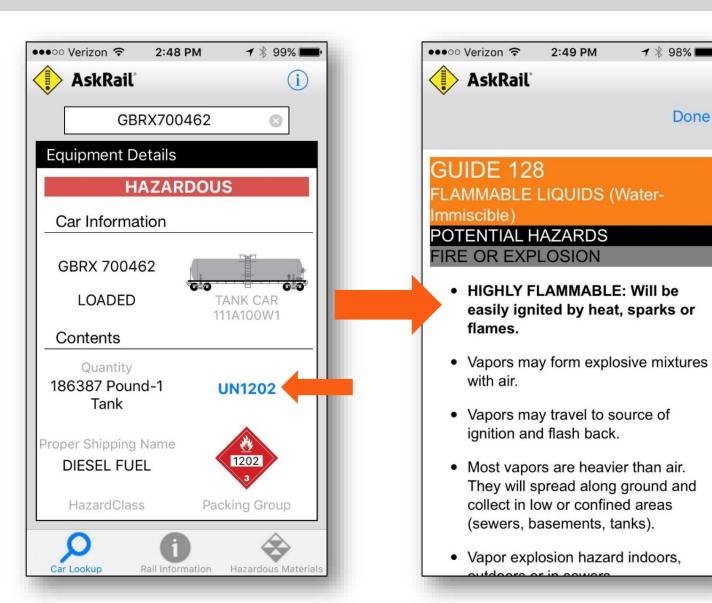
AskRail - View Response Guide



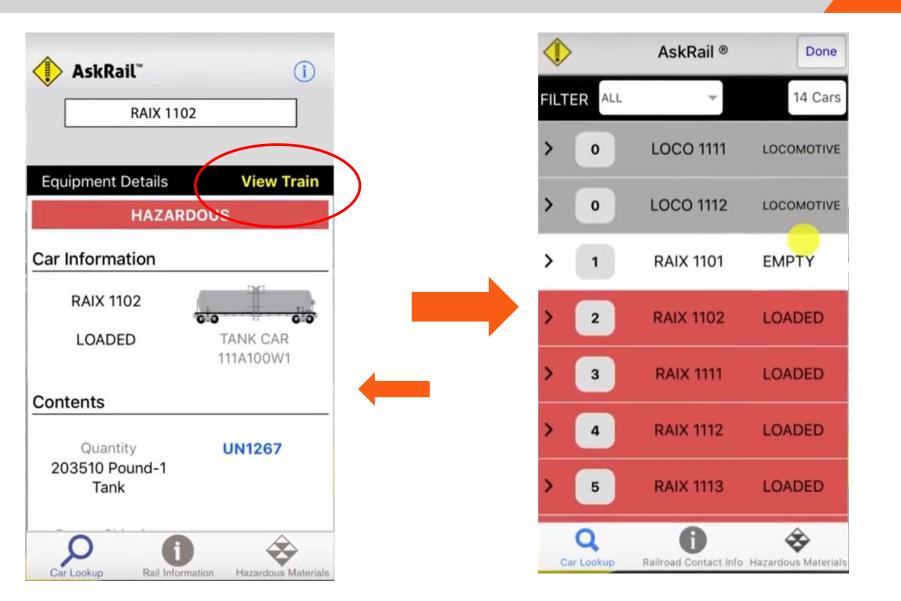
◀ 🖇 98% 💼

Done

2:49 PM

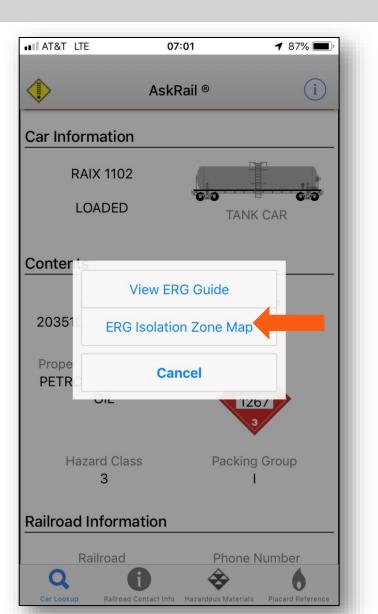


AskRail - View Response Guide

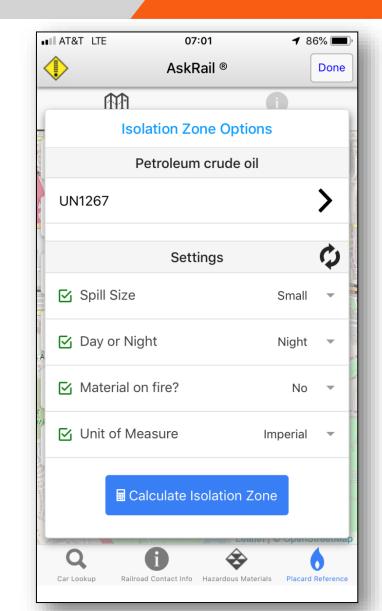


BNSF

AskRail – ERG Isolation Zone

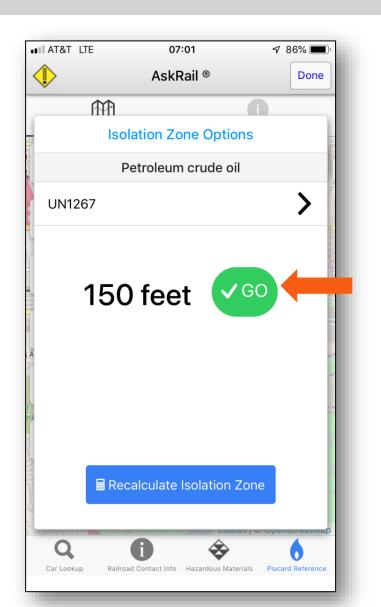


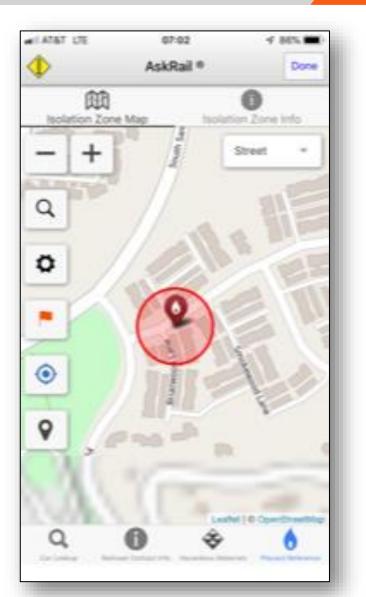
•	II AT&T	LTE 07:01	7	87% 🔳,
~		AskRail ®		Done
1		Isolation Zone Options		
		Petroleum crude oil		
and here	UN1	267		>
		Settings		
	⊠ S	Spill Size Spill	Size	-
	<u> </u>	Day or Night Day or N	ight	-
A	⊡ N	Naterial on fire? Yes or	No?	-
rk	Δ (Unit of Measure U	IOM	-
and the second state of the second		Calculate Isolation Zone		
	Q Car Look	up Railroad Contact Info	Placar	d Reference





AskRail – ERG Isolation Zone









Section V: Railroad Equipment

Railroad Emergency Response & Hazardous Materials Awareness

Locomotives





- Distributive power
- Rear units operated by remote control
- 2-Person Crew Engineer & Conductor
- Other locomotives may contain personnel (Deadheading)

Locomotive Emergencies



Recommended Practices for Responding to and Fighting Locomotive Fires:

- Be aware that locomotives have limited space in the cab, on the walkways, and to inside access panels.
- Responders wearing PPE, SCBA, or bunker gear can have difficulty gaining access to many areas.
- **NEVER** climb on the roof of a locomotive.
- Take response actions from the ground or walkway.
- Use dry chemical or CO_2 fire extinguisher.
- AFFF foam applications for ground fires or pooled fuel fires surrounding locomotives ONLY.
- Protect immediate exposures near the locomotive, i.e. dried grass, bridges, structures, etc.

High-Voltage Capacitors

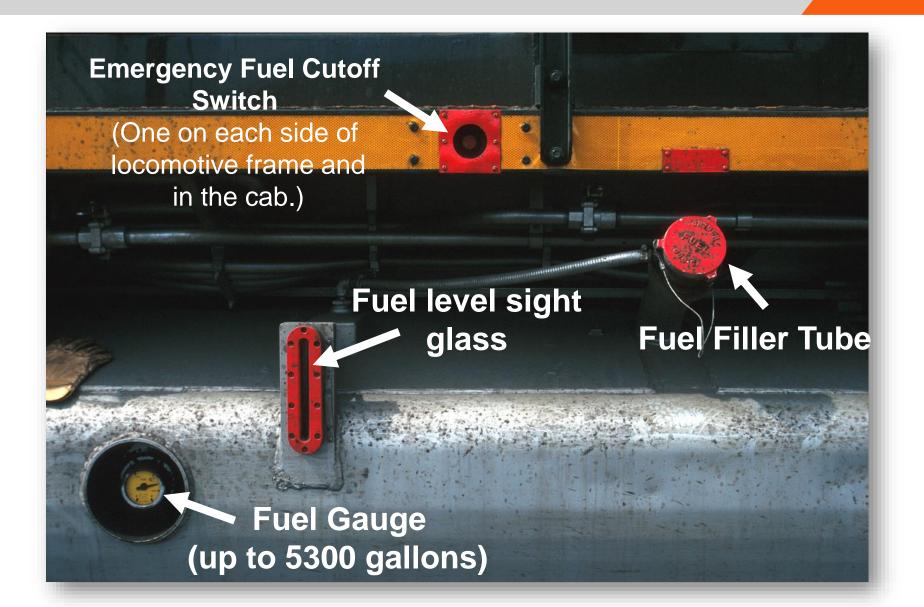




High Electrical Energy Storage!

Locomotive Fuel Tank





Engine Stop and Isolation Switch





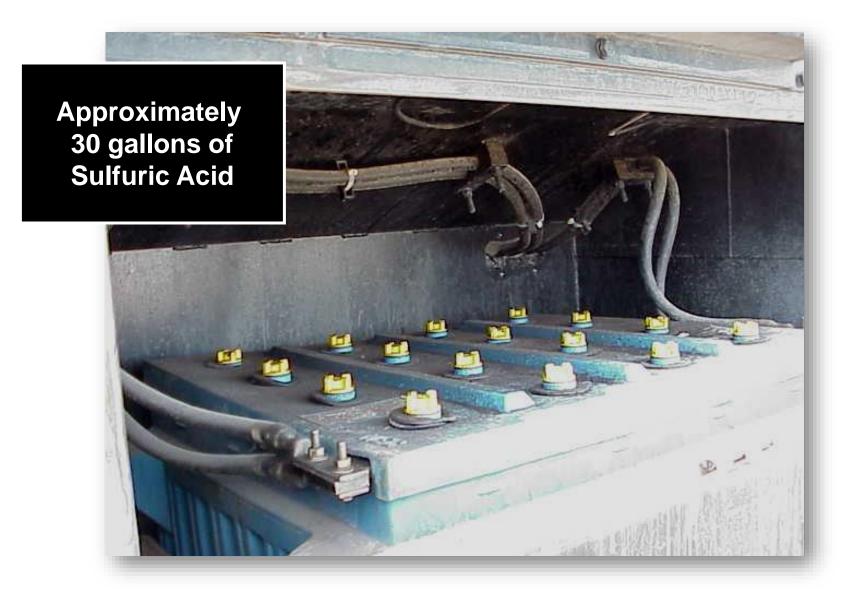
Radiator / Cooling water Reservoir





Batteries – One of two 36V lead acid cells





Spills / Leaks

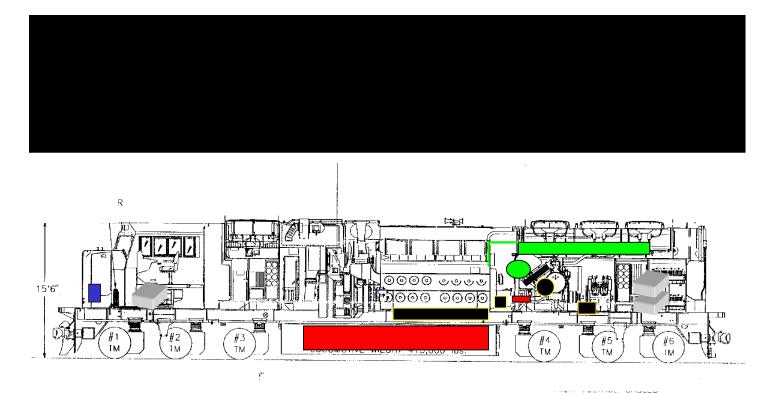


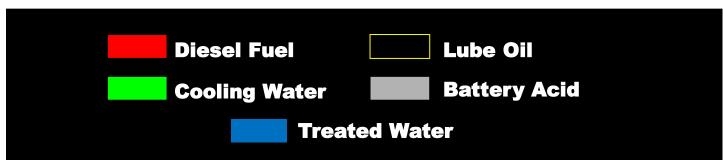


Green	Cooling Water
Red	Diesel Fuel
Black	Lube Oil
Clear	Battery Acid
Blue	Toilet Tank Fluid

Liquid Locations







Locomotive on Fire





What About Passenger Trains?



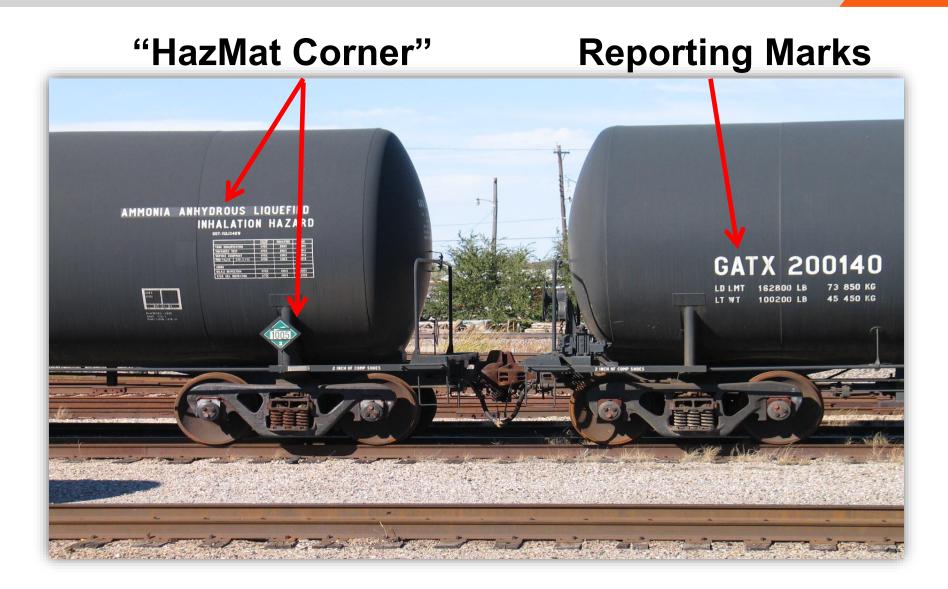


Tank Cars



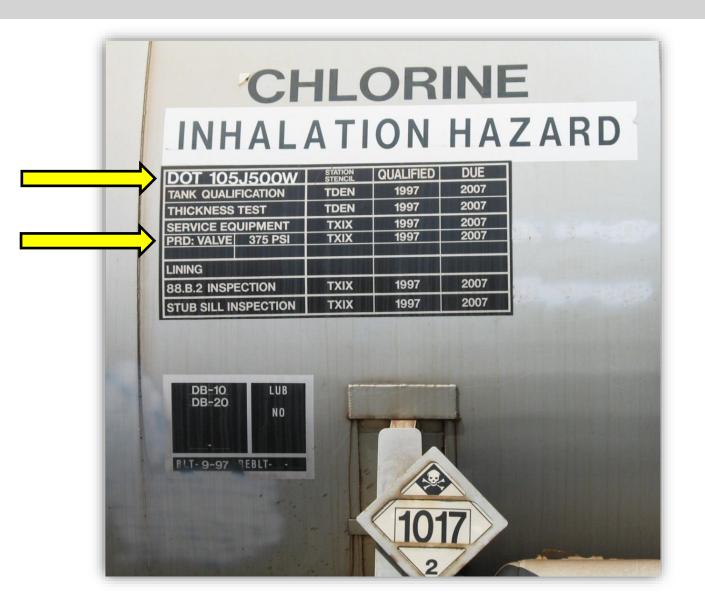


All of those Markings Help with a Size-Up



What can a Responder Learn?





Tank Car Capacity Markings





Capacity marked on both ends

Three Types of Tank Cars



Low pressure = 78% of fleet

- Up to 100psi tank test pressures
- Hazmat and non-hazmat commodities
- AKA "general service" tank car

High pressure = 22% of fleet

- 100 to 600psi tank test pressures
- Hazmat commodities only

Cryogenic liquid tank cars = <1% of fleet

- Up to 25psi, temps down to darn cold
- Also considered a low pressure tank car

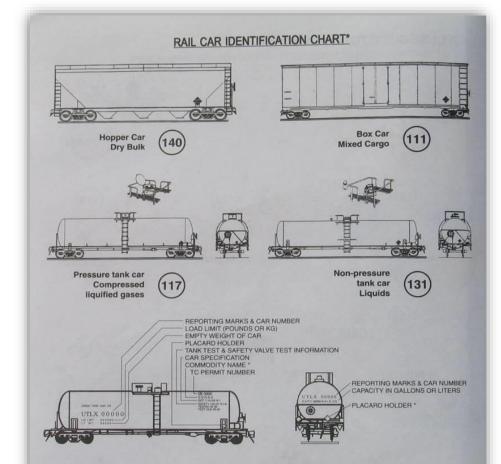
Comparison of Types of Tank Cars





Use the ERG to Help with your Size-Up

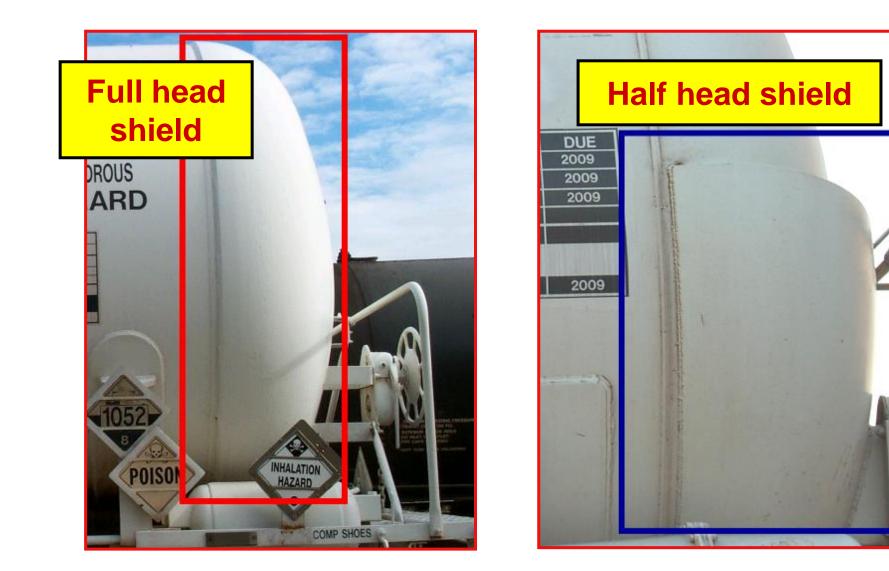




CAUTION: Emergency response personnel must be aware that rail tank cars vary widely in construction, fittings and purpose. Tank cars could transport products that may be solids, liquids or gases. The products may be under pressure. It is essential that products be identified by consulting shipping documents or train consist or contacting dispatch centers before emergency response is initiated.

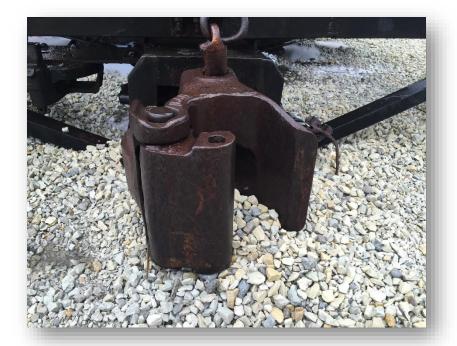
Full or Half Head Shields, as Required





Standard vs Double Shelf Coupler





Janney Coupler patented in 1897 All other cars Hazmat/Non-Hazmat



Double Shelf Coupler All Tank Cars Hazmat/Non-Hazmat

Double Shelf Couplers





The Low-Pressure Family Album



Family Album

Remember:

More" Most common type of tank car Transport both HazMat and non-HazMat products

Low Pressure - General Service Tank Cars





NOT "Non-pressure"

- Tank test pressures up to 100 psi
- Working pressures up to 165 psi
- For Hazardous and Non-Hazardous commodities

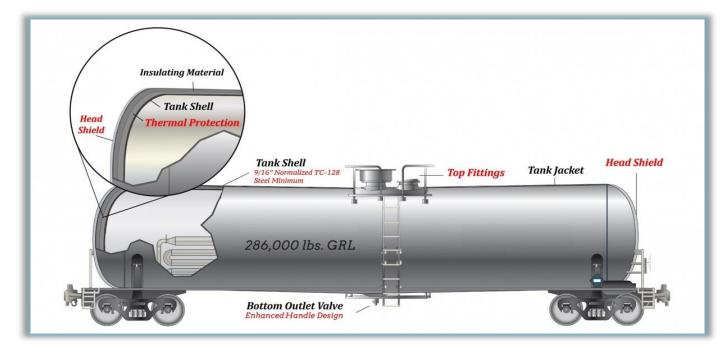
DOT-117 Tank Car





Next Generation Tank Car – DOT-117





Safety enhancements of the DOT-117 Tank Car

Full-height 1/2" thick head shield Tank shell thickness increased to 9/16" Thermal protection Top fitting protection Enhanced bottom-outlet valve design

DOT Retrofit Timetable



Timeline for Continued Use of DOT Specification 111 (DOT-111) Tanks for Use in HHFTs Tank Car Type / Service Retrofit Deadline	
Non Jacketed DOT-111 tank cars in PG I service	January 1, 2018
Jacketed DOT-111 tank cars in PG I service	March 1, 2018
Non-Jacketed CPC-1232 tank cars in PG I service	April 1, 2020
Non Jacketed DOT-111 tank cars in PG II service	May 1, 2023
Non-Jacketed CPC-1232 tank cars in PG II service	July 1, 2023
Jacketed CPC-1232 tank cars in PG I and PG II service** and all remaining tank cars carrying PG III materials in an HHFT (pressure relief valve and valve handles)	May 1, 2025

Do Low-Pressure Tank Cars BLEVE?





Heat-Induced Tear





Insulation and Thermal Protection



- Insulation alone is used to protect product temperature.
- Thermal protection is dense insulation that provide thermal resistance to the car so that that there will be no release of any lading within the tank car, except release through the pressure release device, when subjected to:
 - A pool fire for 100
 minutes
 - A torch fire for 30 minutes.



Cars with Compartments





You want it with how many compartments?



Manways





- Used for tank loading and unloading
- 6 or 8 swing bolts
- Sealed with a gasket
- Swing bolts must be tool tight

Pressure Relief Valves (PRD)

Pressure relief valves are utilized to relieve internal pressure of the tank car to prevent a catastrophic failure

May engage due to...

- Tank Car Overfilled
- Chemical reaction
- Broken Spring
- Excess internal pressure

May release due to...

- Failed O-Ring(s)
- Compromised Spring
- Incorrect adjusted spring pressure

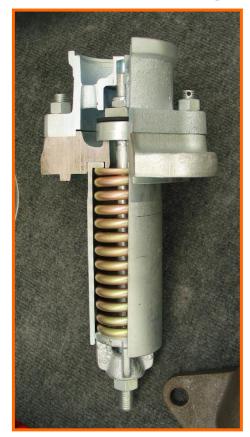


Identify setting on side of tank car and apply gauge!

Pressure Relief Valves (PRD: Valve)



Internal Spring

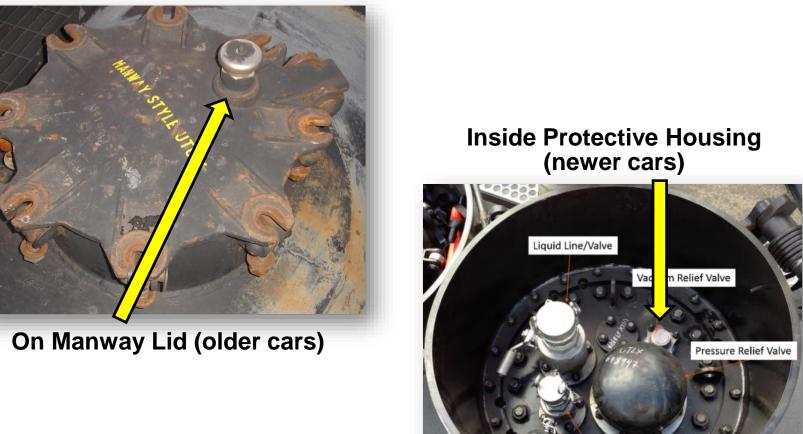


External Spring



Vacuum Relief Valves





Vapor Line/Va

Bottom Outlet Valves





(with skid protection)

Bottom Outlet Valves





BOV w/ Skid Protection – Ball Valve Intact

Bottom Outlet Valve Magnet





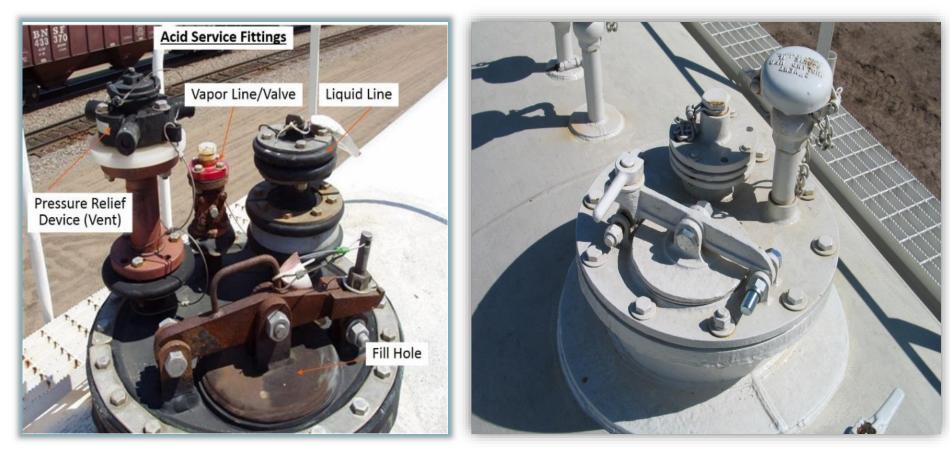
Low Pressure: Corrosive Materials





Fittings for Corrosive Material Tank Cars





Modern configuration

Older configuration

Pressure Relief Vent (PRD: Vent)



AKA Frangible Disc or "Rupture Disc"



Good condition

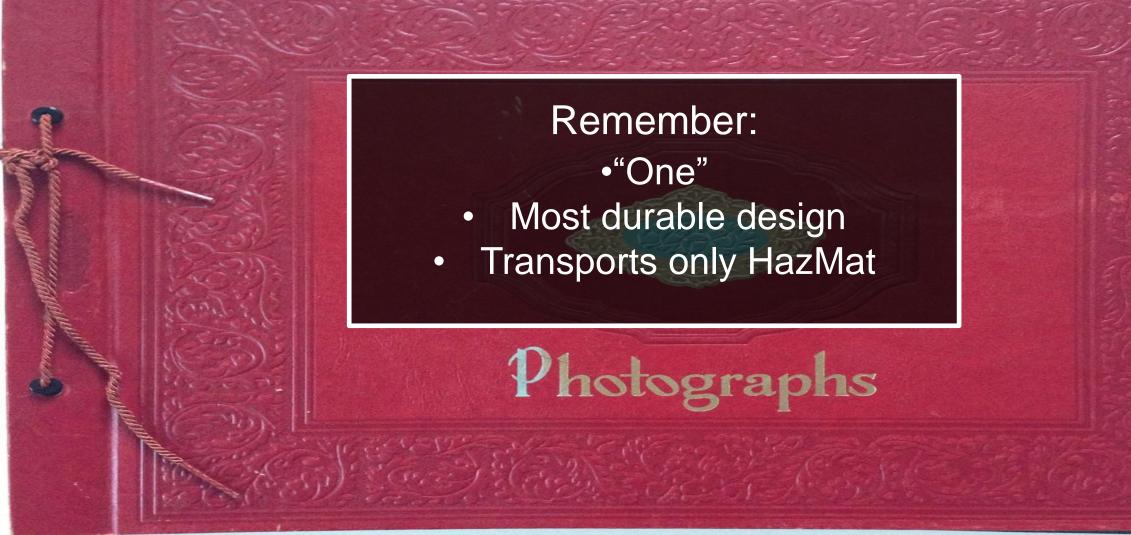




"Ruptured" condition

The High Pressure Family Album





High Pressure Tank Cars



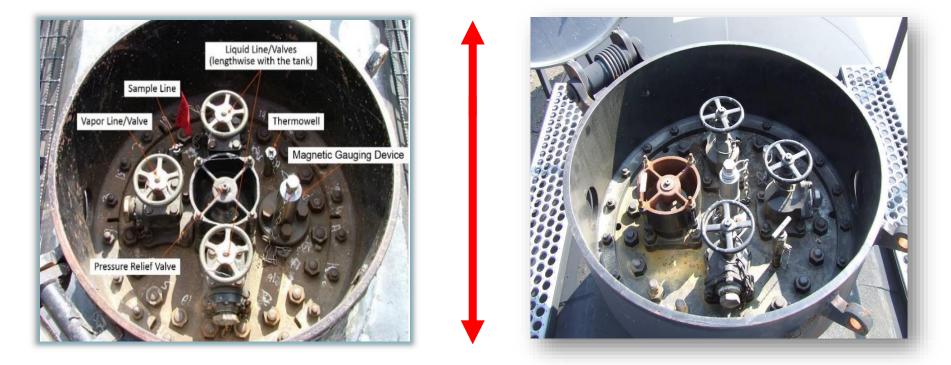


The **BEST** HazMat package in transportation

- Tank test pressures from 100 psi to 600 psi
 - Working pressures from 90 psi to 350 psi

High Pressure Cars: Valves and Fittings



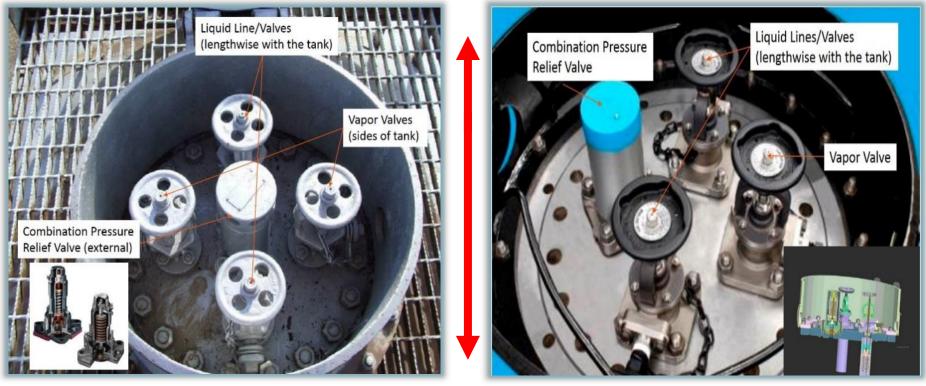


Liquid valves are placed in-line with the length of the car.

LPG / Ammonia / Propane

High Pressure Cars: Valves and Fittings





Older Style

"Next-Gen"

Liquid valves are placed in-line with the length of the car.

Chlorine

Excess Flow Valves

- Stops product flow if hose breaks during transfer operations or valve is sheared off
- Prevents product flow if tank is upside down
- Located Under:
 - -Liquid Lines
 - -Vapor Lines
 - -Sample Lines
 - -Slip Tube Gauging Device

Chlorine cars have these on liquid lines only



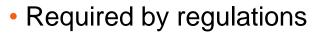


Excess Flow Valves





Pressure Relief Valves (PRD)



- Open at pre-determined internal tank pressure
 - Usually 75% of tank test pressure – Where do you find that info?
- Re-closes when pressure lowers to acceptable levels
 - Might not seal again –
 What do you do?
- Two Types
 - Internal spring
 - External spring





How do You Stop Leaks?





Chlorine "C" Kit

- Chlorine
- Sulfur Dioxide (w/correct gaskets)



How do You Stop Leaks?





Kelso Kit

- LPG
- Propane
- Ammonia
- Chlorine

How do You Stop Leaks?



- LPG
- Propane
- Ammonia
- Chlorine

Most Common Leaks in High Pressure Tank Cars





Cryogenic Tank Cars





Most don't have top fittings

Control valves are in a cabinet underneath



Cryogenic Markings: Specific / Informational





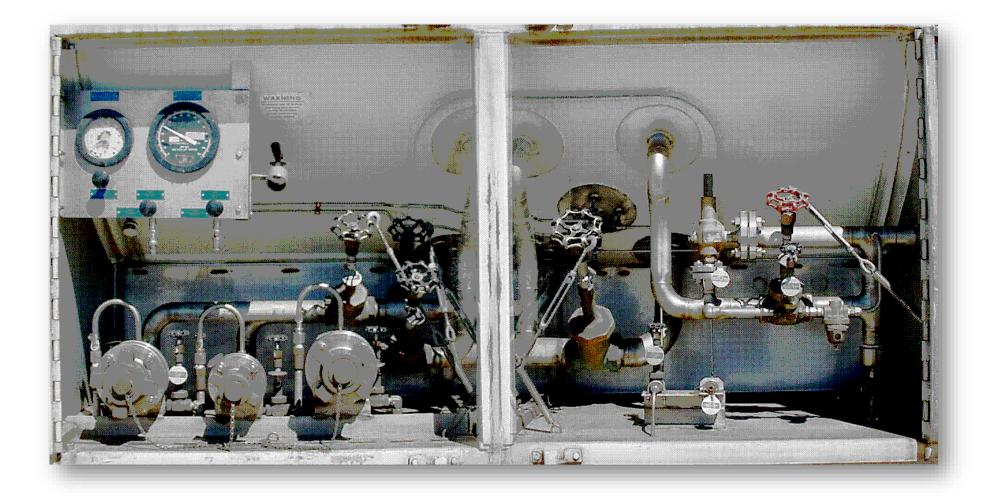
Valves





Consult the Shipper / Consignee for Info





Normal Venting





Normal Venting





Not "Normal Venting"





Intermodal Freight of all Kinds (FAK)



 Materials that are <u>NOT</u> <u>HAZMAT</u> are not listed on the shipping papers

 <u>Example:</u> UPS shipments have approximately 2000 customers per trailer and that includes holiday gifts





Reports and Information

Railroad Emergency Response & Hazardous Materials Awareness

www.BNSFHAZMAT.com





SUBJECT HAZMAT HOME COMMUNITY RESPONDERS

ESPONDERS HAZMAT CONTRACTORS 🔒 BNSF HAZMAT TEAM 🖨 CONTACT

BNSE HAZMAT COMMUTED DO SAFEDY Insiste is designed to be used by community first responders, contractors and contract safety at BNSE. We value your dedication and support.

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CUSTOMERS

EMERGENCY CONTACT NUMBER 1-800-832-5452

BNSFHAZMAT

This site is designed to be used by community first responders, our BNSF customers, contractors and internal hazmat team who work together to ensure hazmat safety at BNSF

We value your dedication and support.

NEW TRAINING OPPORTUNITIES ADDED FOR FIRST RESPONDERS

BNSF HAZMAT TEAM

HA7MAT CONTRACTORS

ONLINE TRAINING

COMMUNITY TRAINING

JOIN OUR LIST TO RECEIVE UPDATES FROM BNSF HAZMAT

JOIN TODAY

www.BNSFHAZMAT.com





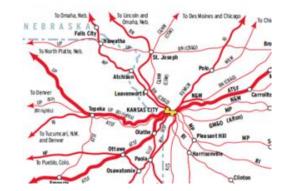
Rail Safety Education







Rail Crossing Locator



Commodity Flow Reports

Commodity Flow Studies



- Is your agency interested in doing a transportation risk analysis for your area?
 - Do you need information for emergency planning or security planning?
 - Do you need to know what the most commonly transported hazardous materials are for your area?

The Hazardous Material Commodity Flow Study is available electronically through:

http://www.bnsfhazmat.com

Rail Hazardous Materials Traffic Flow

(Previous 4 Quarters)



			RESIDUE	LOADED	RESIDUE	LOADED	TOTAL
STCC	STCC	CLASS	CAR	CAR	INTER-	INTER-	LOADED
NUMBER	DESCRIPTION	CODE	COUNT	COUNT	MODAL	MODAL	COUNT
4905752	LIQUEFIED PETROLEUM GAS	2.1	3633	2571	0	0	2571
4910165	PETROLEUM CRUDE OIL	3	1882	2233	0	0	2233
4908176	GASOLINE	3	226	1533	0	0	1533
4961605	ELEVATED TEMPERATURE LIQUID, N.O.S.	9	1370	1382	0	0	1382
4907265	STYRENE MONOMER, STABILIZED	3	1011	1056	0	0	1056
4905424	BUTANE	2.1	277	879	0	0	879
4930228	HYDROCHLORIC ACID	8	676	755	0	0	755
4905421	LIQUEFIED PETROLEUM GAS	2.1	946	629	0	0	629
4930040	SULFURIC ACID	8	513	485	0	0	485
4907428	HYDROCARBONS, LIQUID, N.O.S.	3	304	388	0	0	388
4909152	ALCOHOLS, N.O.S.	3	215	298	0	0	298
4904509	CARBON DIOXIDE, REFRIGERATED LIQUID	2.2	211	177	0	0	177
4961619	ELEVATED TEMPERATURE LIQUID, N.O.S.	9	142	138	0	0	138
4909230	METHANOL	3	101	136	0	0	136
4905419	LIQUEFIED PETROLEUM GAS	2.1	213	118	0	0	118



Specialized Response Equipment

Railroad Emergency Response & Hazardous Materials Awareness

Industrial Fire-fighting Foam Trailers

BNSF

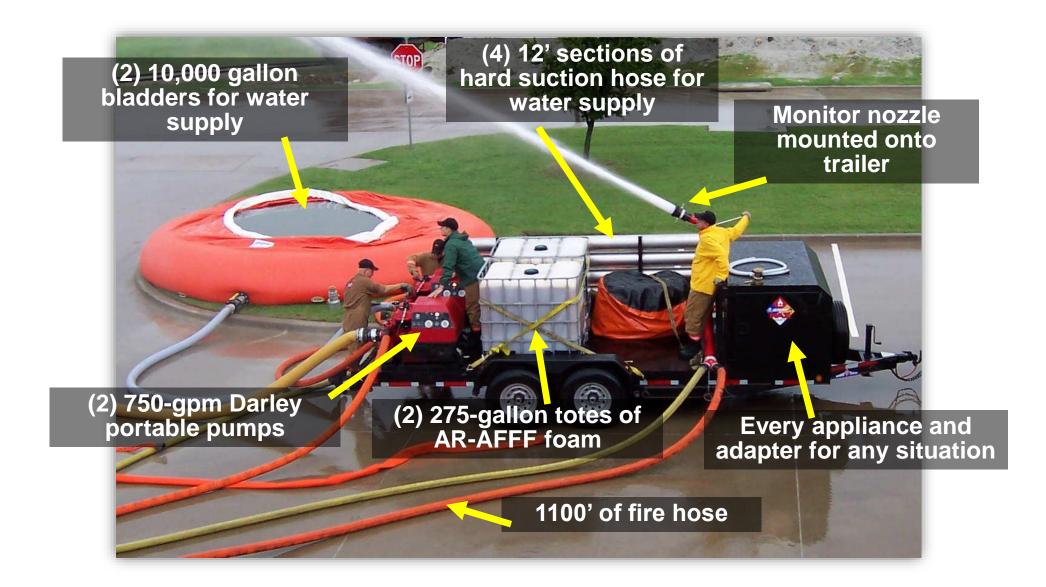
- Fleet of 32 on HazMat routes across BNSF's network
- Alcohol-resistant (AR-AFFF) foam covers spilled material and deprives it of oxygen
- Available to other railroads and local communities as an asset
- Designed to address Ethanol and Crude Oil shipments

Trailers are mobilized to the location of an incident and contract industrial firefighters are deployed to operate the equipment



What Equipment is on the Fire Trailer?

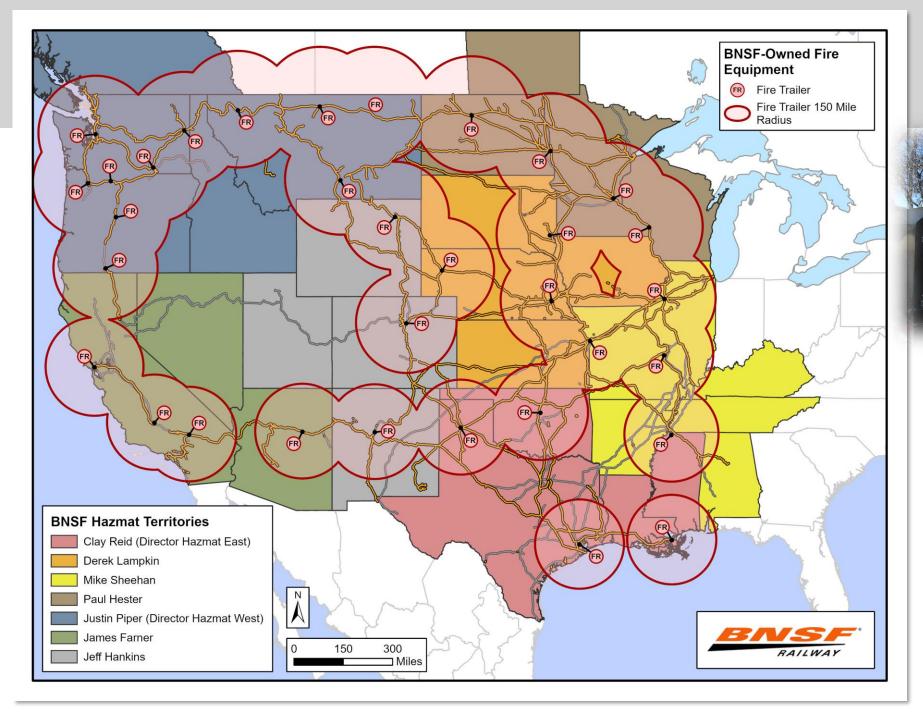




Fire Trailer Utilized by San Leandro/Alameda County FD







RAILWA

Fire Trailers (150 Mile Radius) HAZMAT Resources

Air Trailers





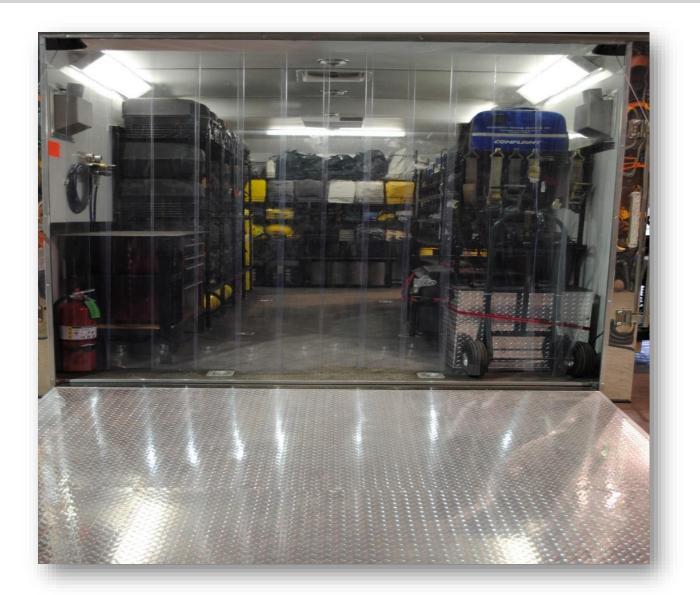
What Equipment is in the Trailer?

- (10) SCBAs with spare cylinders (CA, IL, WA, CO) -TX = 20/20
- 10-15 minute "Ska-Pak's" for use with large cylinders and whip airlines for wrecking equipment
- (10) Whip airlines (50 ft)
- (40) Scott AV3000 full-face respirators
- Bauer portable breathing air compressor
- Spare parts
- PPE



Inside of the Air Trailer





Inside of the Air Trailer





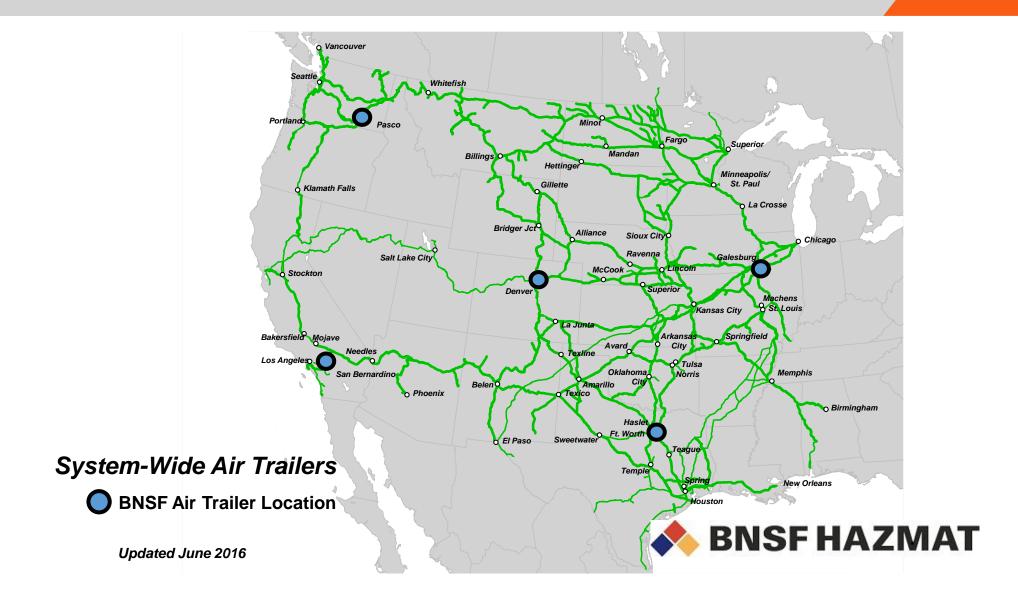
Spare Air Cylinders





Air Trailer Locations





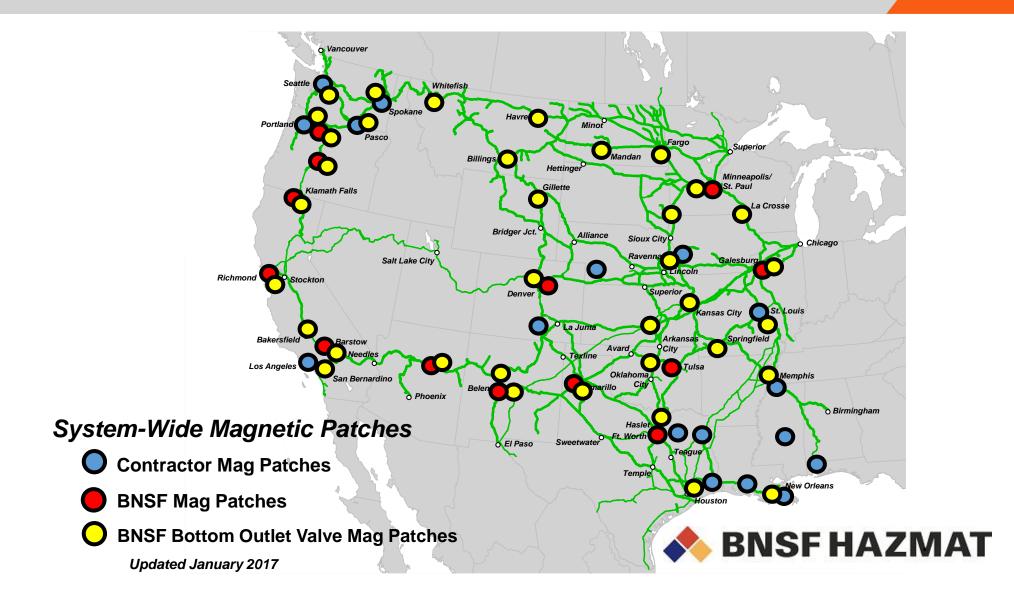
Specialized Mitigation Equipment





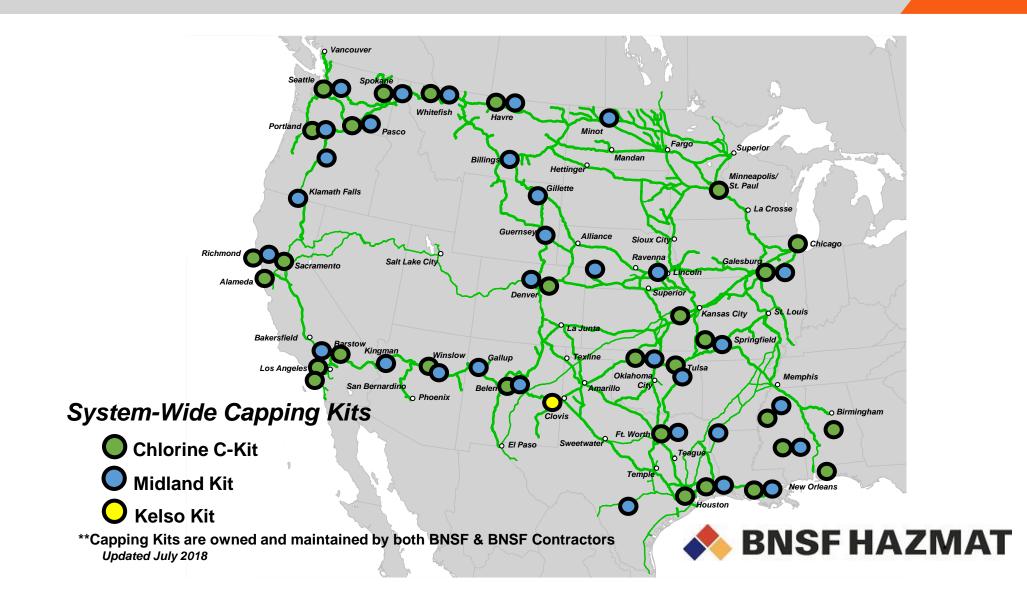
Magnetic Patch Locations





Capping Kits





Air Monitoring Assets





CTEH

- 24-hour access to PhD Toxicologists and Dispersion Modelers
- Utilize Safer® Star Air Dispersion Model offering topographical model input

TacTox Kit (22 Kits total)

 MultiRAE 4-gas monitor w/ PID, Kestrel weather meter, Solar Irradiance meter, Detector Tubes/pump, GPS, Calibration gases and equipment

GHD

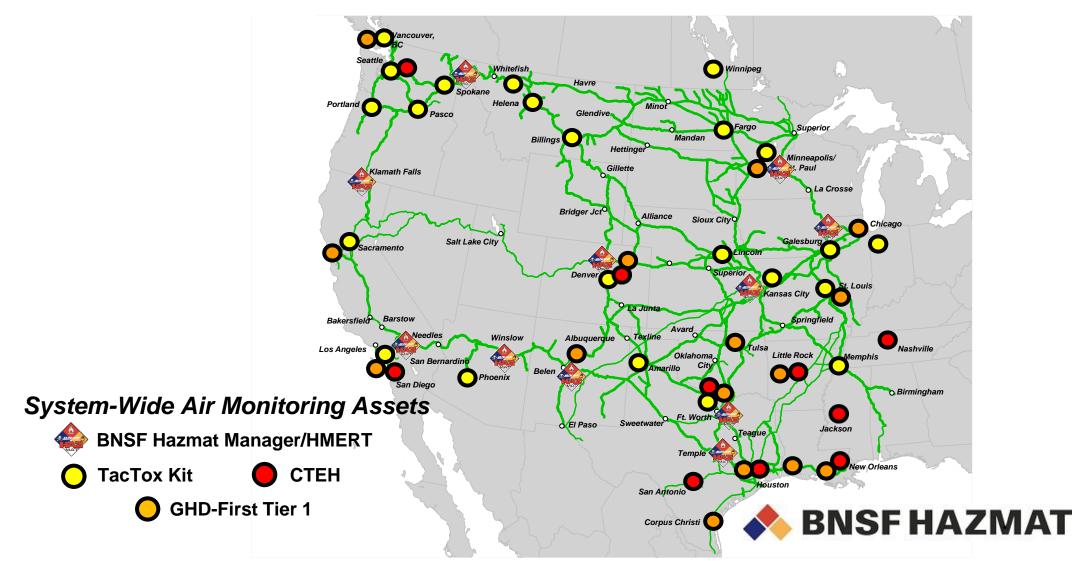
- Multi-Media sampling Air, surface water, groundwater, soil
- GIS mapping and support

BNSF HazMat Manager/HazMat Emergency Response Team

- MultiRae 4-gas monitor w/PID
- O₂-H₂S-Cl₂-LEL-PID

Air Monitoring Asset Locations





Updated April 2019

Wildland Fire Assets





Protecting our Assets





"Sparky"









BNSF Fire Train-Barstow, CA





Photos by Ezequiel Ramirez

BNSF Fire Train-Barstow, CA





Photos by Ezequiel Ramirez

BNSF Fire Train-Barstow, CA





Photo by Ezequiel Ramirez

BNSF Fire Train Caboose-Barstow, CA





Photos by Ezequiel Ramirez

QUESTIONS?

BNSFHAZMAT

Railroad Emergency Response & Hazardous Materials Awareness