



Railroad Safety Advisory Committee



Dark Territory Working Group Update

Presentation to The 44th Railroad Safety Advisory Committee Meeting

May 20, 2011
Washington, DC



Dark Territory Task

Rail Safety Improvement Act of 2008 Requirement

Sec. 406. Development and Use of Rail Safety Technology in Dark Territory

Purpose: To prescribe **standards, guidance, regulations, or orders** governing the development, use, and implementation of rail safety technology in dark territory

Task presented On September 23, 2010 in Washington, DC

- **Task No.:** 10-02
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RSAC Task Statement

Description

- Review the **existing** signal and train control **regulations** and determine their application to the use of safety technologies in dark territory
- Review **other existing federal regulations** that are associated with the use of advanced technology and may provide additional insight/direction
- Assist FRA in **developing/identifying additional standards, guidance, regulations, or orders** responsive to the legislative mandate
- Help to ensure the **appropriate** and **safe development and use** of safety technologies in dark territories
- Help to determine a reasonable method for **safety technology inventory** and system awareness by FRA.

Review what we already have for conventional systems

Review what we already have for advanced technology

Develop new

Ensure adherence

Keep track



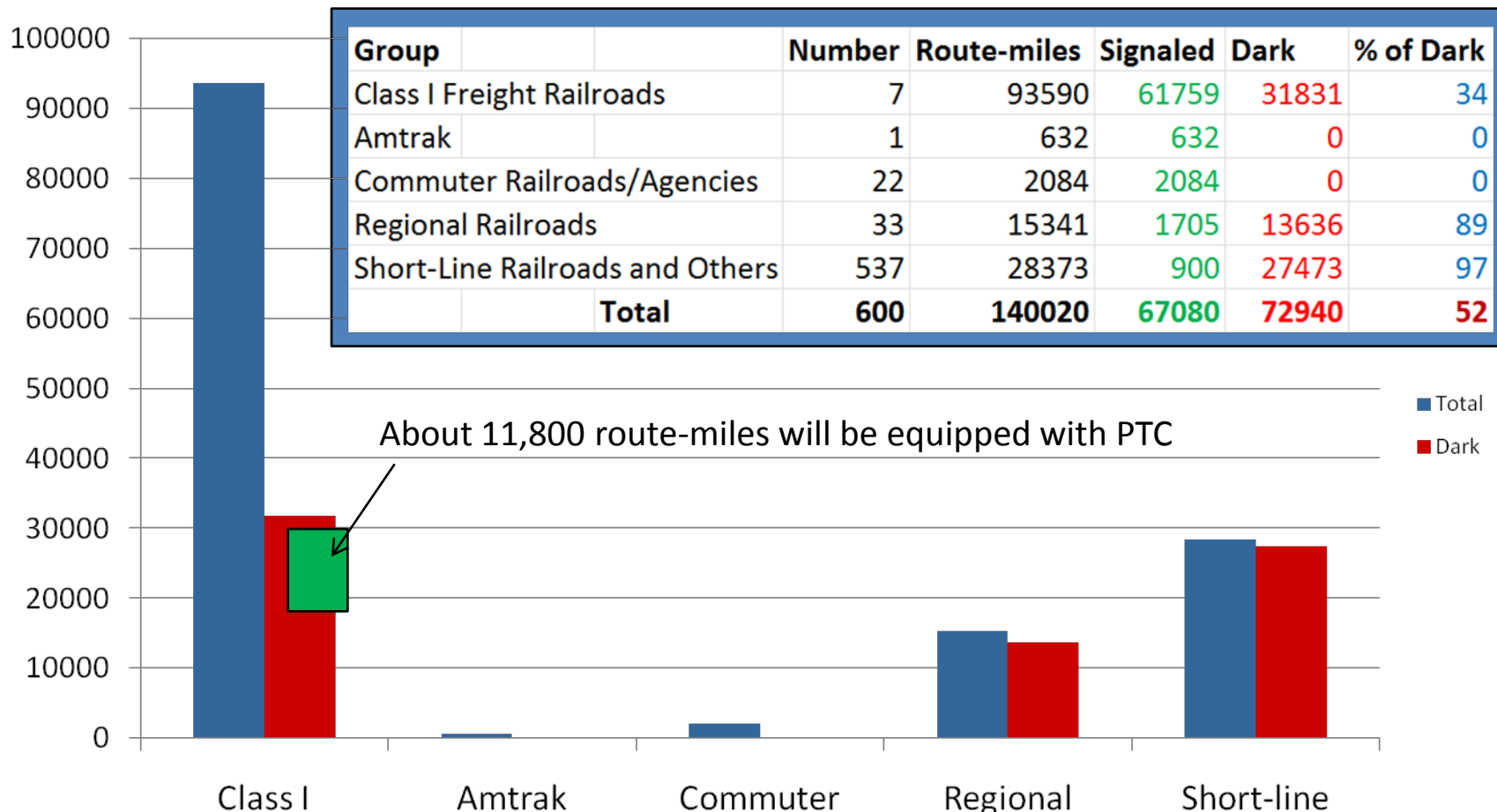
First DT WG Meeting

**Falls Church, Virginia
March 3 & 4, 2011**

Topics presented:

- Discussed the Congressional mandate.
 - Held a general discussion on the areas of interest.
 - Had a quick look at dark territory statistics including accidents.
 - Identified types of the technology that exists in DT.
 - Discussed some of the appropriate technologies to mitigate identified safety issues.
 - Reviewed some technologies through vendor presentations.
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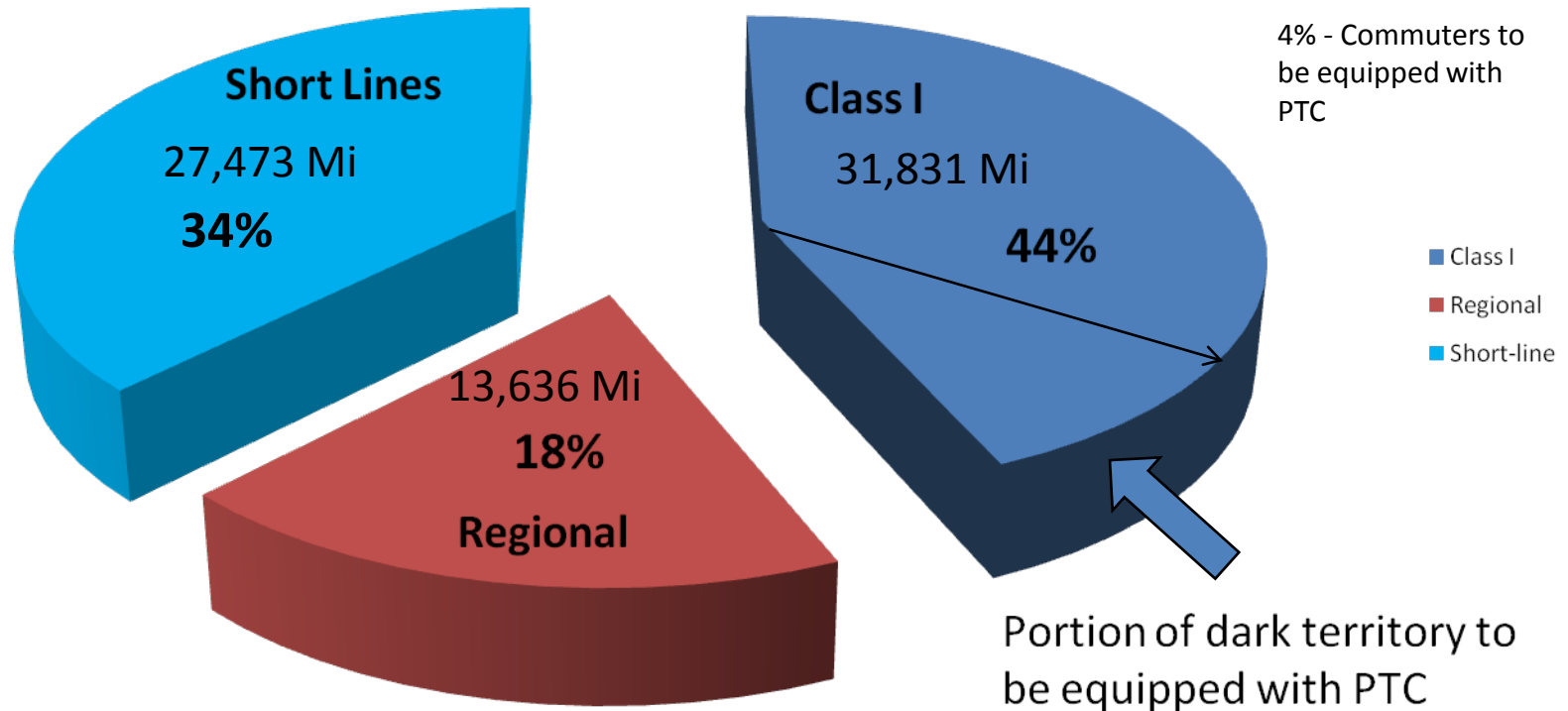
Portion of Dark Territory on U.S. Railroads



Total: 140,020 route miles
Dark Territory: 72,940 route-miles (52%)

Route-Mileage in Dark Territory

Entities to be affected by regulatory and/or non-regulatory safety measures



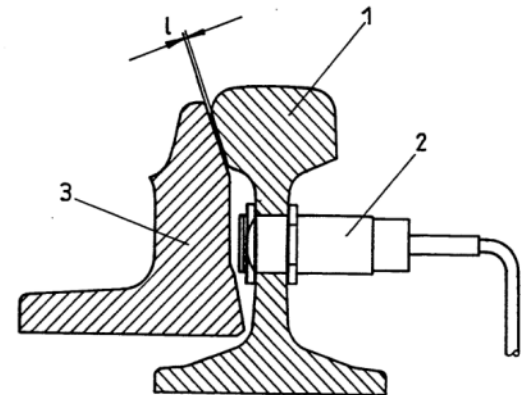
11,800 route-miles of DT to be equipped with PTC constitutes 16% of all DT route-miles

Power Assisted Switch (PAS) Signals/Indicators



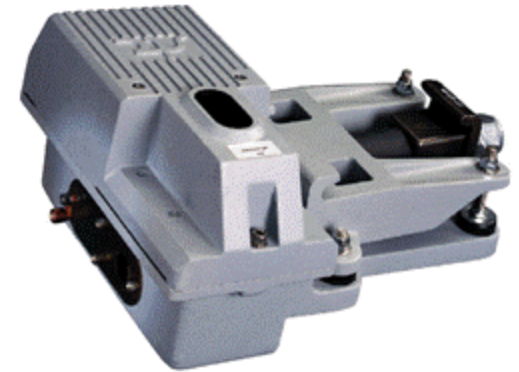
Switch Position Monitoring Devices or Indicators

- Use of devices to monitor NOT throw or move switches
- Use of technology to monitor switch point position
- Use of existing devices within Dark Territory
 - (Switch Circuit controllers)



Unusual Contingency Detection Devices

- High-water detectors
- Slide Fence
- Land slide
- Special track condition detectors
- Bridge misalignment detectors
- Hot-Box detectors
- Dragging equipment detectors
- Impact wheel detectors
- Ultrasonic wheel testing



First DT WG Meeting, cont.

Results (continued):

- Defined the scope – Main Tracks and Main Track passing sidings outside of yards.
 - Agreed to use a data driven process.
 - FRA has no preconceived notions.
 - Concentrate first on existing/applied DT technology (1st Bucket) versus future DT Technology (2nd Bucket).
 - Homework assigned to help understand the issues.
 - Inventory of Already Implemented DT Technology
 - Identify the Numbers of Technology Elements
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Two-Phase Approach

Current Use (1st bucket)

- **Power-Assisted Switches**
- **Switch Position Monitoring**
- **Track Integrity Systems**
- **Unusual Contingency Detectors**

Future Use (2nd bucket)

- **Voluntary Installation of Current Use Devices**
- **Potential Risk-Based Required Installations**
- **New or Novel Technologies**



Second DT WG Meeting



Washington, DC May 9-10, 2011

Six Step Approach:

1. Top level review of the Dark Territory Accident History.
2. Develop a prioritized list that identifies the most important issues.
3. Select the most important issues (current use bucket) for immediate consideration by the DT Working Group.
4. Form task force groups to fully explore the selected issues and develop a strategy to develop standards and improve safety.
5. Task force groups report findings to the full Working Group.
6. Working Group concurs with Strategy.



Dark Territory Accident Statistics



Class I, Main Lines

Railroad	Route miles		Route miles, %		Traffic Volume, Trillion GTM		Traffic Volume, %		Number of Accidents		Number of Accidents, %*		Accidents/ Trillions GTM		Ratio D/S	% of all Acc/Trill GTM Attrib. to DT
	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark	Signaled	Dark		
#1	19614	6785	74.3	25.7	1,067,798	53.996	95.2	4.8	1349	283	82.7	17.3	1.26	5.24	4.15	80.6
#2	10426	5733	64.5	35.5	373,265	27.475	93.1	6.9	438	104	80.8	19.2	1.17	3.79	3.23	76.3
#3	11044	5951	65.0	35.0	520,687	56.638	90.2	9.8	562	189	74.8	25.2	1.08	3.34	3.09	75.6
#4	15271	7426	67.3	32.7	1,123,073	88.533	92.7	7.3	1045	247	80.9	19.1	0.93	2.79	3.00	75.0
#5	1062	1665	38.9	61.1	36,69	15.75	70.0	30.0	94	89	51.4	48.6	2.56	5.65	2.21	68.8
#6	3353	3101	52.0	48.0	91,99	15.719	85.4	14.6	134	43	75.7	24.3	1.46	2.74	1.88	65.3
#7	1102	974	53.1	46.9	27,379	18.221	60.0	40.0	53	19	73.6	26.4	1.94	1.04	0.54	35.0
Total:	61872	31635	66.2	33.8	3,240,882	276.332	92.1	7.9	3675	974	79.1	20.9	1.13	3.52	3.11	75.7

*Data on accidents is given for a 6 year period from 2003 to 2008

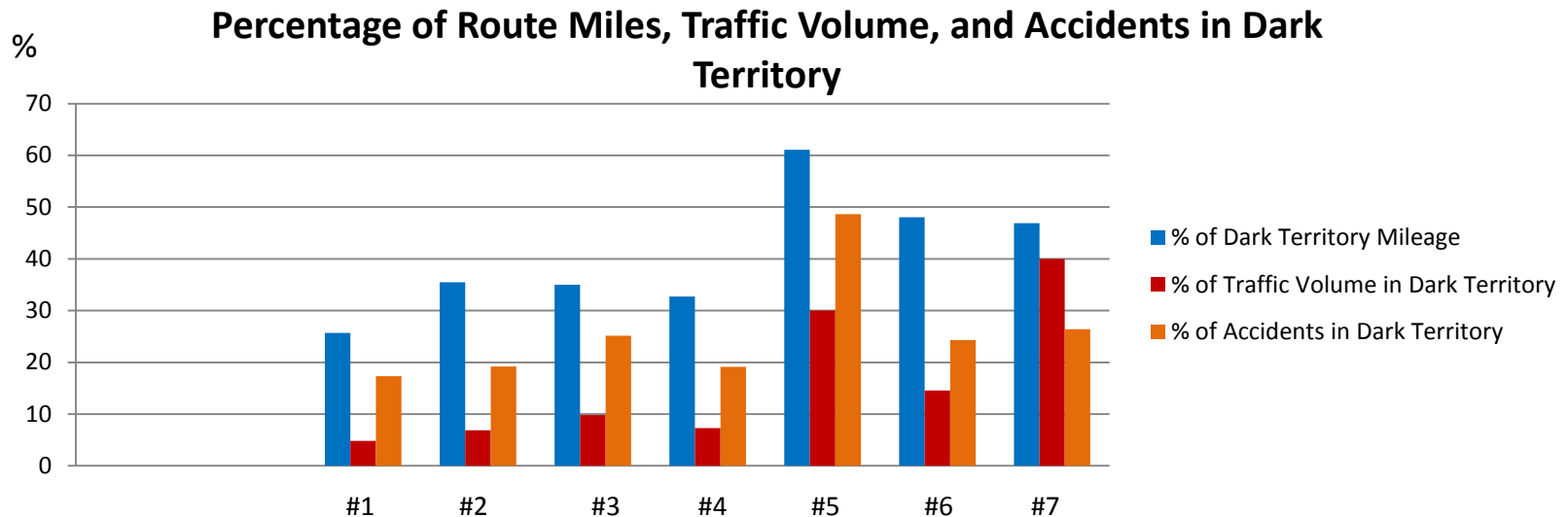
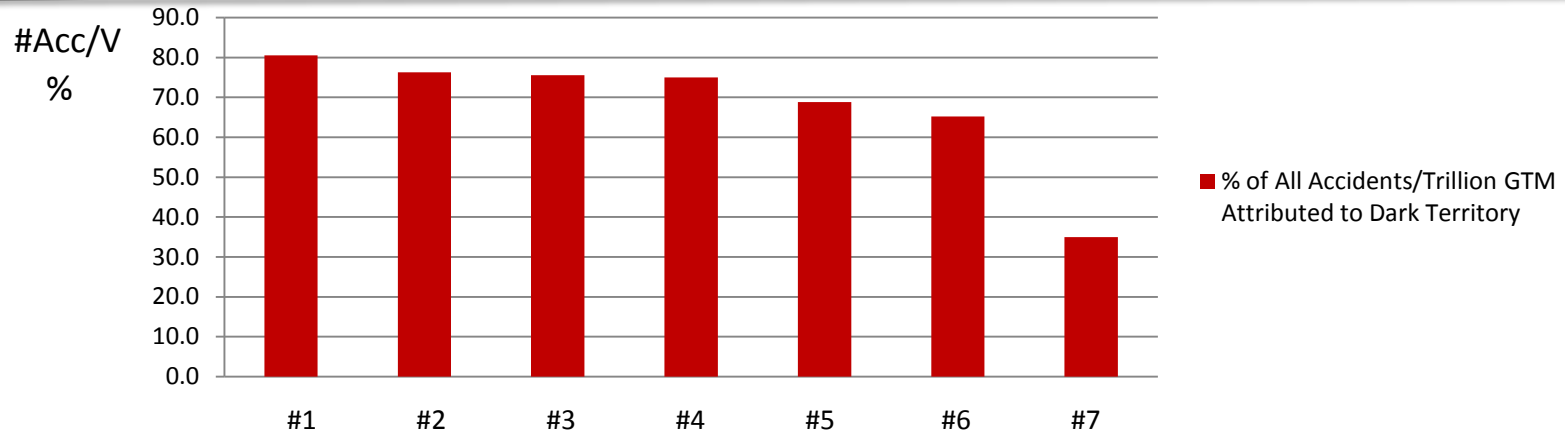


Dark Territory Accident Statistics

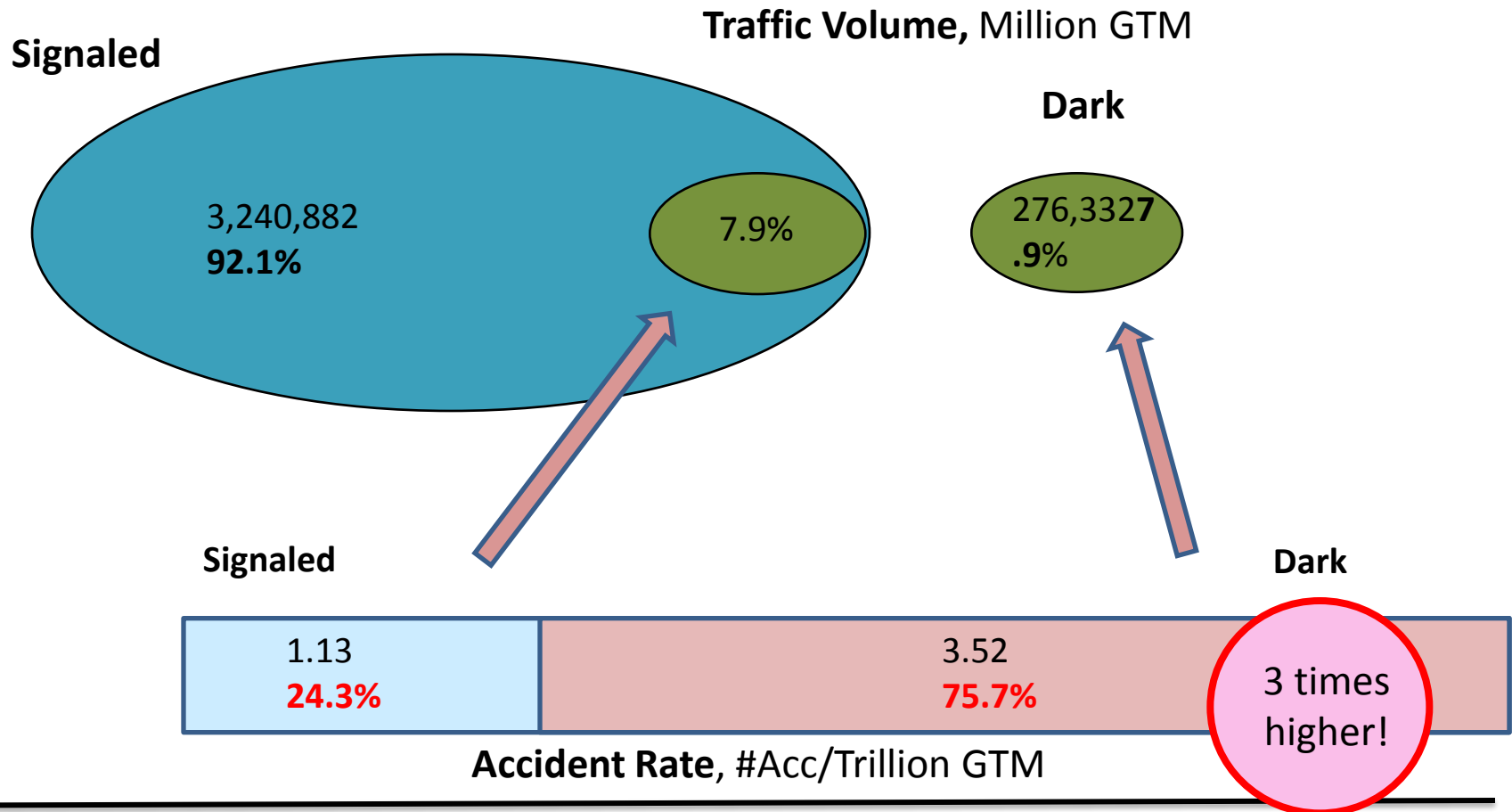
Class I, Main Lines



% of All Accidents/Trillion GTM Attributed to Dark Territory

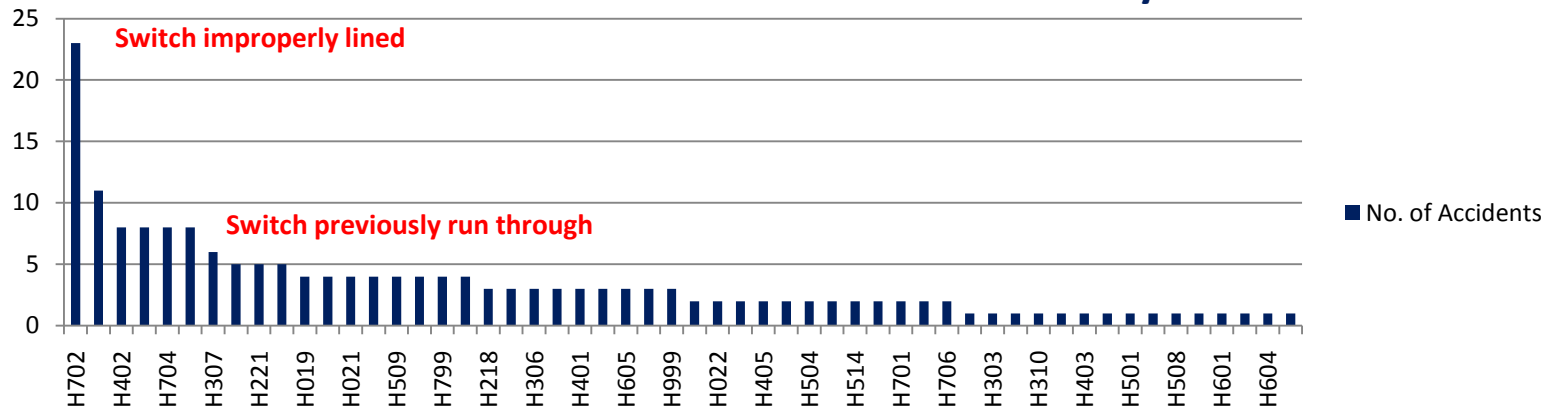


Accidents per Traffic Volume Rate for Class 1s

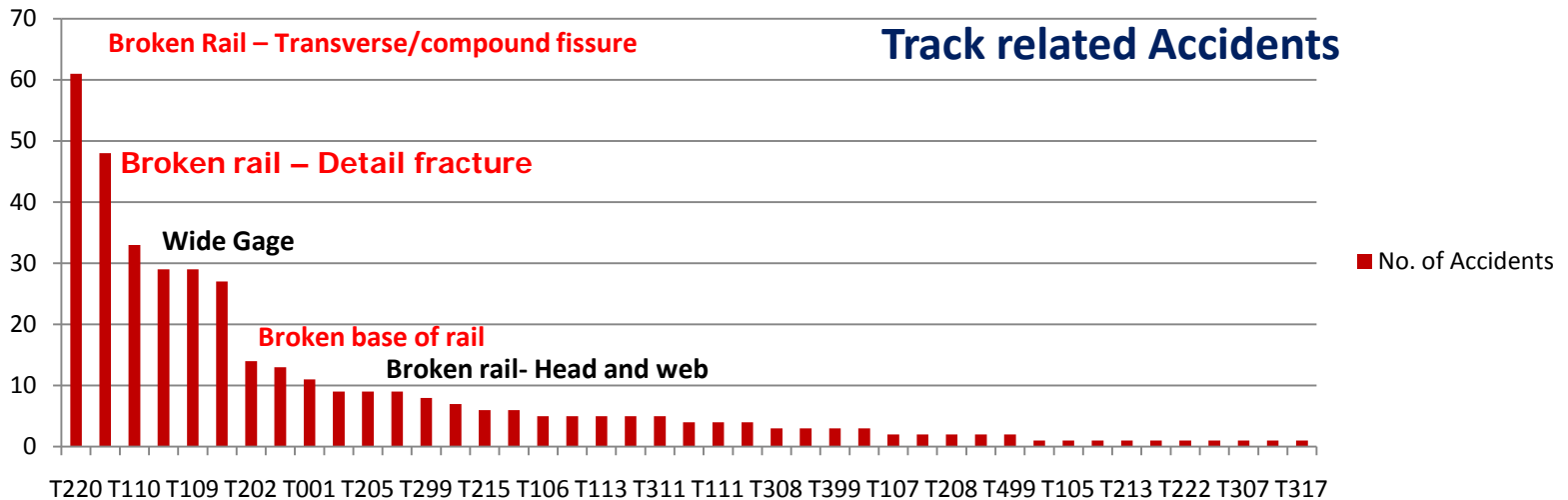


Cause of Accidents in DT (2003-2008)

Accidents Caused by Human Factors

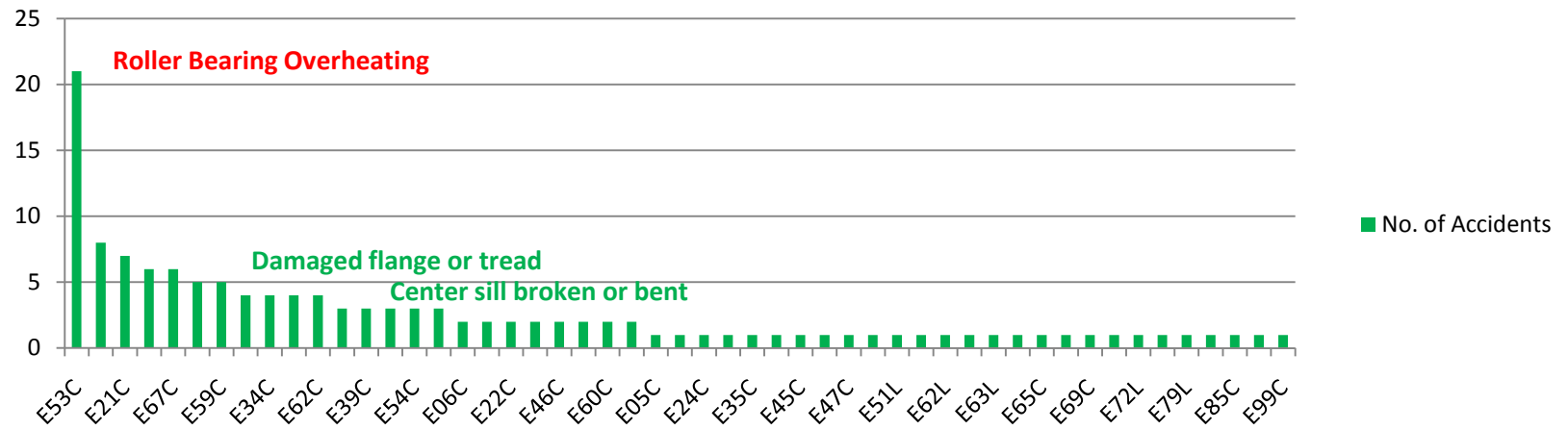


Track related Accidents



Cause of Accidents in DT (2003-2008)

Mechanical & Electrical



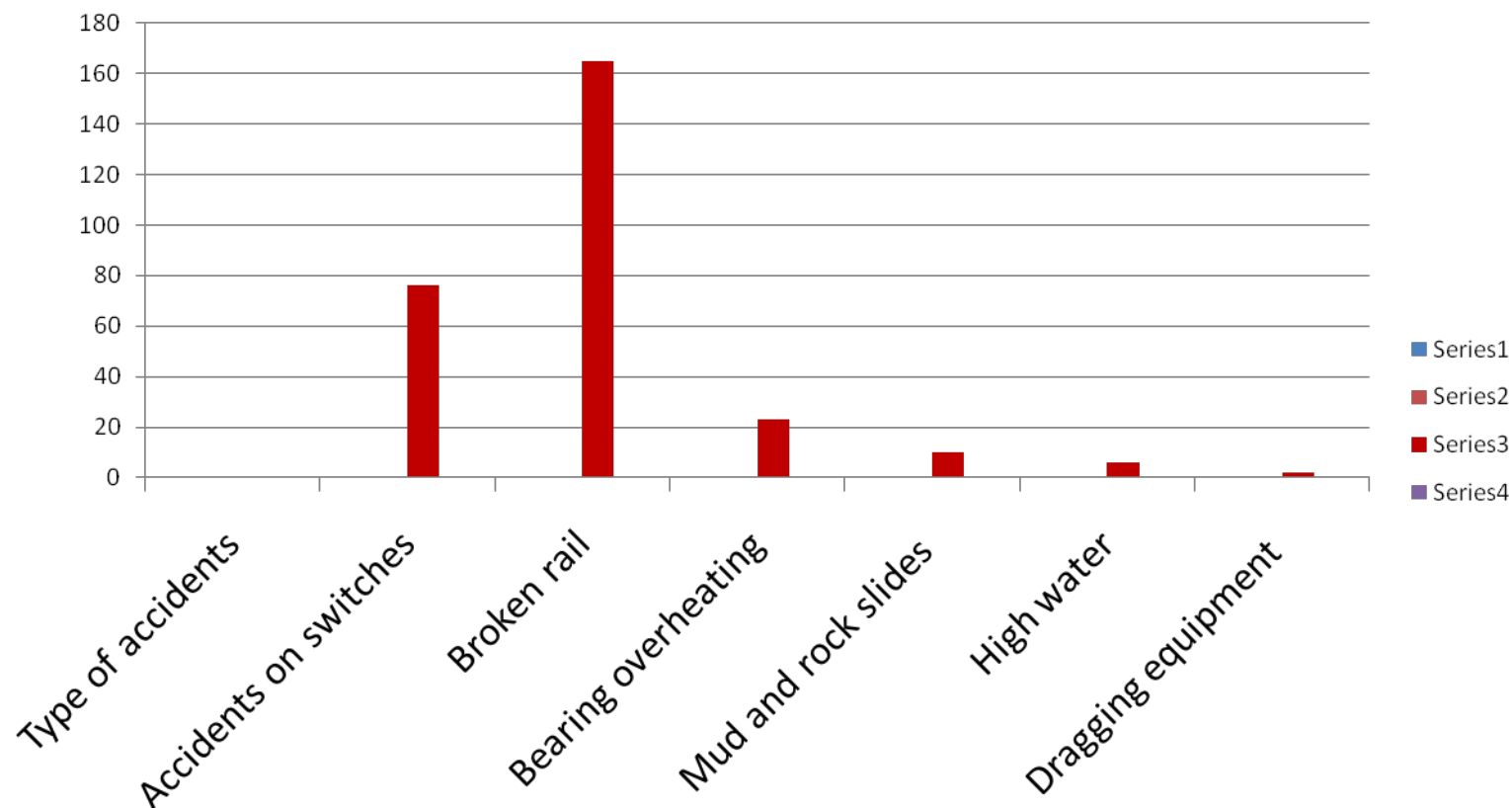


Types of Accidents that Can be Reduced by the Existing Safety Technology



Type of accidents		Accidents Statistics	Safety technology to reduce accidents
Accidents on switches		76	Switch detectors, Power assisted switches
Broken rail		165	Track integrity warning systems
Bearing overheating		23	Hot box detectors
Mud and rock slides		10	Slide fences, etc.
High water		6	High water, Flood detectors
Dragging equipment		2	Dragging equipment detectors

Statistics on Types of Accidents that Can be Reduced by the Existing Safety Technology





Existing Technology Inventory in Dark Territory Provided by RSAC Members



	Class 1	Short Lines
• Hand operated switches	6526	4341
• Switch Point Monitored	13	227
• Power Operated Switches	167	75
• Track Integrity Systems	-- *	61
• Unusual Occurrence Detectors	203	61
• High Water Detectors	1	1
• Slide Fences	5	3
• RCL Zone Limiting Devices	1	0
• Car Counters	0	17
• Scour Detectors	9	0

* Track integrity warning systems on Class 1 railroads only in PTC territory

Phase I – Current Use Bucket

Three primary topics seem to rise to the top

1. Switches

Associated with the use and position of

2. Track integrity

Broken rail

3. Defective conditions

Both mechanical and wayside



What Safety Technologies May Address These Three Topics?



1. Switches

Switch position monitoring

Power-assisted switches

2. Track integrity

Broken rail detection systems

3. Defective conditions

Defect (hazard) detection systems

Task Force Groups Formed

GROUP 1

Switches

GROUP 2

Track Integrity





GROUP 3

Defect Detectors

Each group consists of representatives of:

**FRA
LABOR
CLASS Is
SHORT LINES
SUPPLIERS
OTHERS**

Six Steps

1. Analyze Accident History 
 2. Develop a Prioritized List 
 3. Select Issues 
 4. Form Task Force Groups 
 5. Report Findings and Strategy
 6. Agree on Strategy
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Railroad Safety Advisory Committee



Questions?