

RAIL ASSET MANAGEMENT FOR THE NON-RAILROADER

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Rail operations, construction and maintenance is a secondary activity for many industries. Mines, ports, agriculture, manufacturing, chemical plants, etc.

This presentation will discuss Rail Asset Management Strategy at a high level for managers that don't have a detailed technical understanding of Railways.



DERAILMENTS:

- COST OF EMERGENT REPAIRS, CAR DAMAGE AND LADING LOSS
- DELAY TRAIN RECEIVE AND DEPARTURE
- DELAY UNLOADING AND SHIPPING
- INSURANCE PREMIUMS
- REGULATORY FOCUS
- PUBLIC RELATIONS





Railways were the cutting edge of 19th Century technology.

Some of the what you are managing could date from then.





Variables include:

- Age of the track
- Amount of traffic



New facilities on small footprints





- Type of traffic
- Who does the switching? (Not the Railway anymore.)
- Car maintenance





Mining companies are in the railway business all over the world



Rail Asset Management Strategy

Start with a written policy

- Deliver business objectives
- Management of the capital and maintenance costs - life cycle, expected life of track and equipment
- Operational performance (seasons)
- Risk management









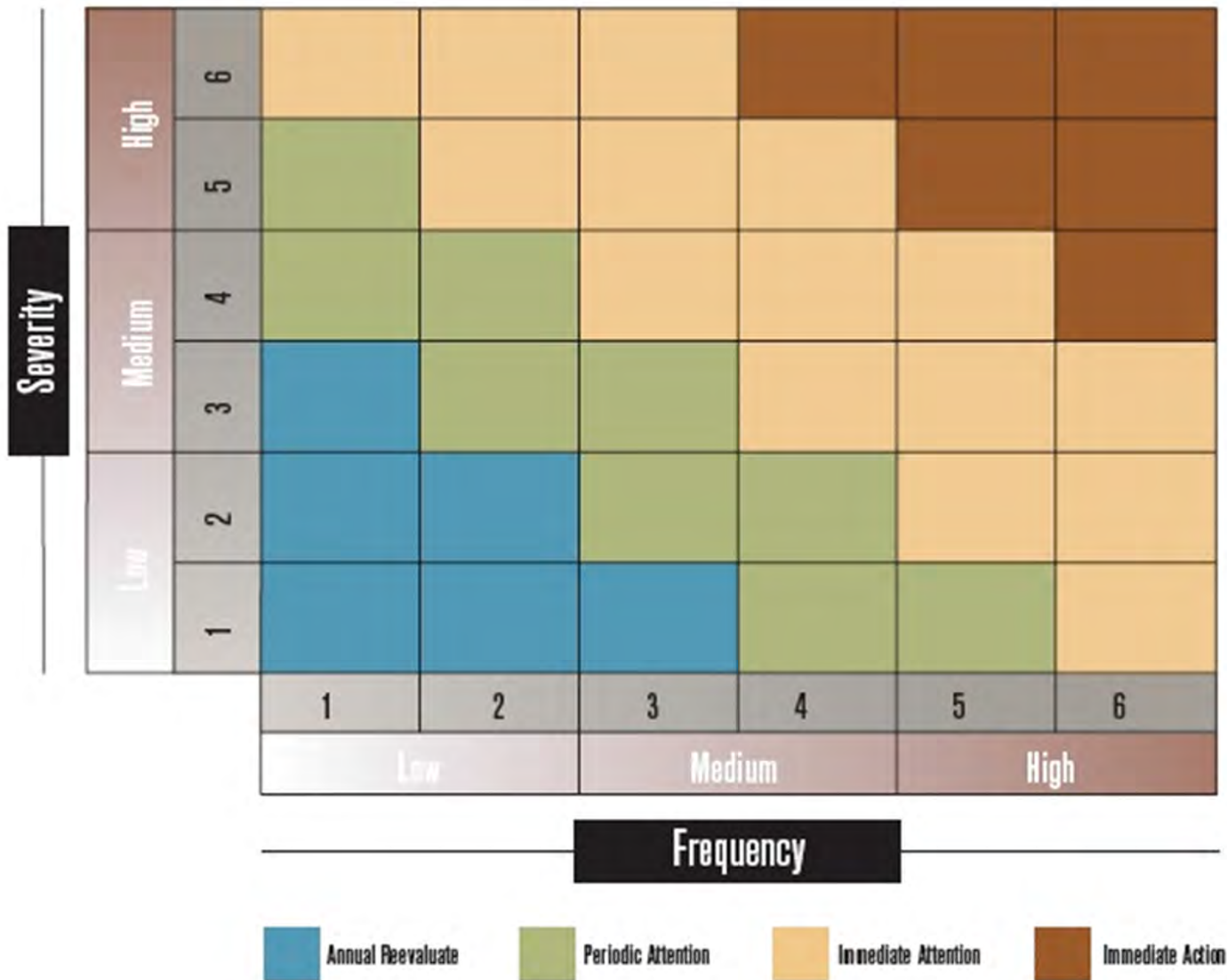
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RISK EVALUATION MAP



Policy Priorities

- **Safety**
- **Quality**
- **Value**



Policy Priorities

- **Safety – Accident/Severity**
- **Quality – Meet defined standards**
- **Value – Lowest life cycle costs**



Reversed Priorities

- **Value - There is only so much money; make it work**
- **Quality – It will have to be good enough**
- **Safety – I hope it works out or someone will get fired**



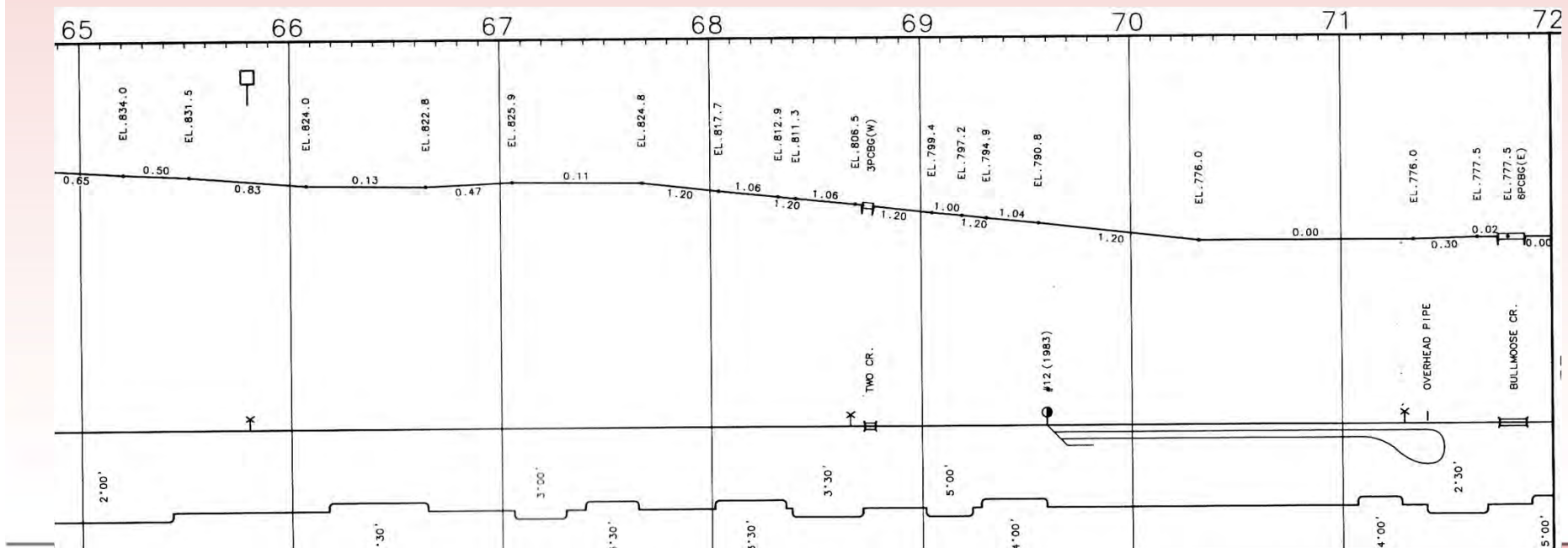
- Maintenance starts with a detailed inventory of the assets
- History of programs, maintenance and costs
- History of failures
- Kept it current (This requires effort)
- It can't rely on personal memory of staff



- Track profile showing structures, curves, grades, road crossings, utilities, property lines

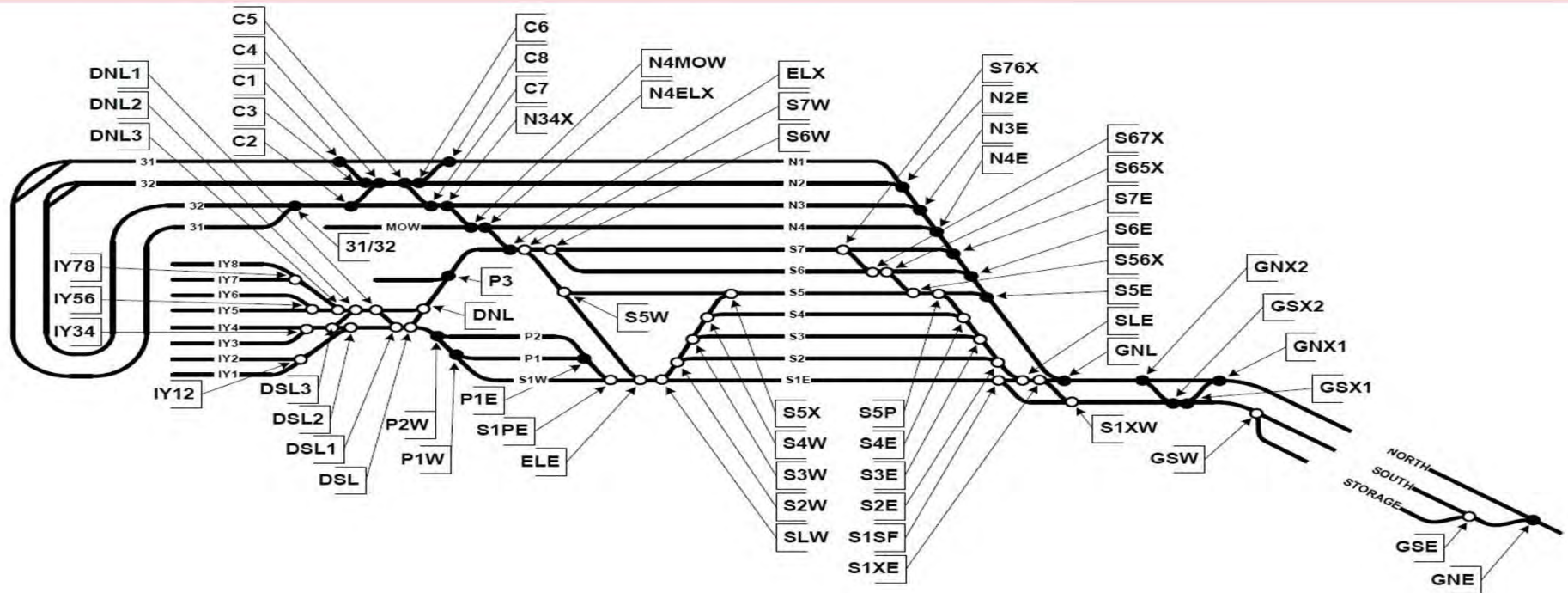
Add

- Type and age of rail
- Type of crosstie and fasteners



Yard Plans

- Numbered switches
- Named tracks with clear lengths
- Utilities
- Drainage and run-off controls







- Spill response





Structure drawings, inspections and maintenance





What do large Railways demand from preferred customers?

- Unit train length receive and departure tracks
- Storage of idle cars
- Private switching
- 7/24 operation
- Train marshalling and car inspection
- Rapid turn around of cars/locos
- Flexibility for service disruptions



When picking a plant site, achieve the lowest freight rates and best service by:

- Have access to two Class 1 Railways
- Supply, store and maintain a dedicated car fleet
- Negotiate long term contracts with service commitments
- Facilitate “drop the handles” and “hook and haul”
- No priority or special services



Regulations

- For a “deregulated industry”, there are a lot of regulations; subject to sudden change; Federal and State
- Track inspection, car inspection, locomotive inspection, radio communications, medical rules, work/rest rules, safety critical issues with personnel and hazmat cargo, etc, etc
- Must be integrated into a safety management system appropriate to the level of activity



The rules are minimums that require “repair or slow down”.

If defects are found by government inspection, fines and orders affecting operation can result.

Minimum compliance with Transport Canada Rules Respecting Track Safety or U.S CFR Part 213 – Track Safety Standards won't give you safe derailment-free track





- Is this track good for 25mph or must it be slowed to 10mph?





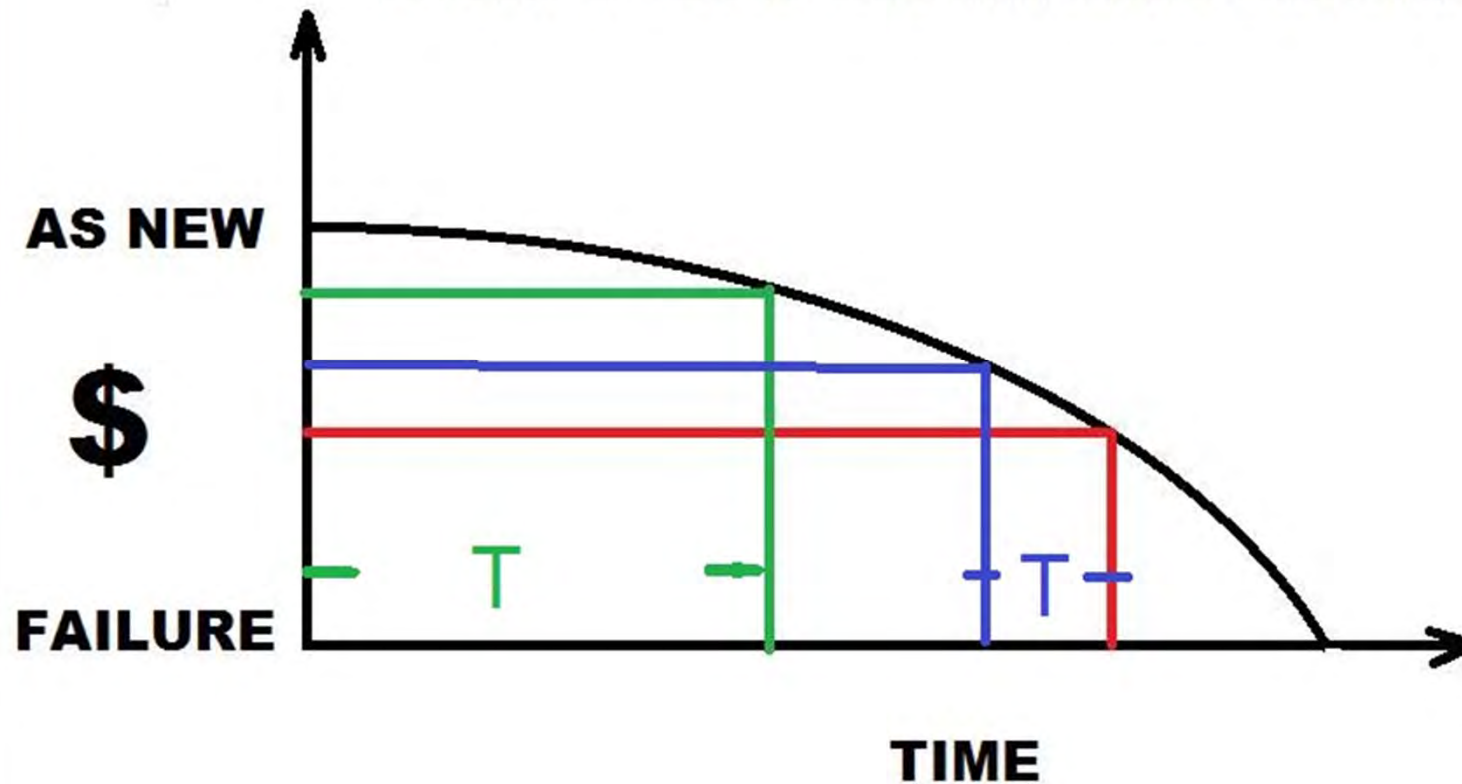
8 good ties in 23
some of which
have to be close
to the joints and
the Track meets
Class 3 for 40
mph tangent track







DON'T DEFER MAINTENANCE



Maintenance dollars do not buy as much time farther down the condition curve











Good drainage is the basis of all safe track;
you can't tamp mud.



Derailement Data

FRA 2011 – 2014 for Class III
Railways with less than 400,000
employee hours;
Exceed ~ \$10,000 damage or
other serious criteria

Main track	340
Other than main track	<u>498</u>
	838

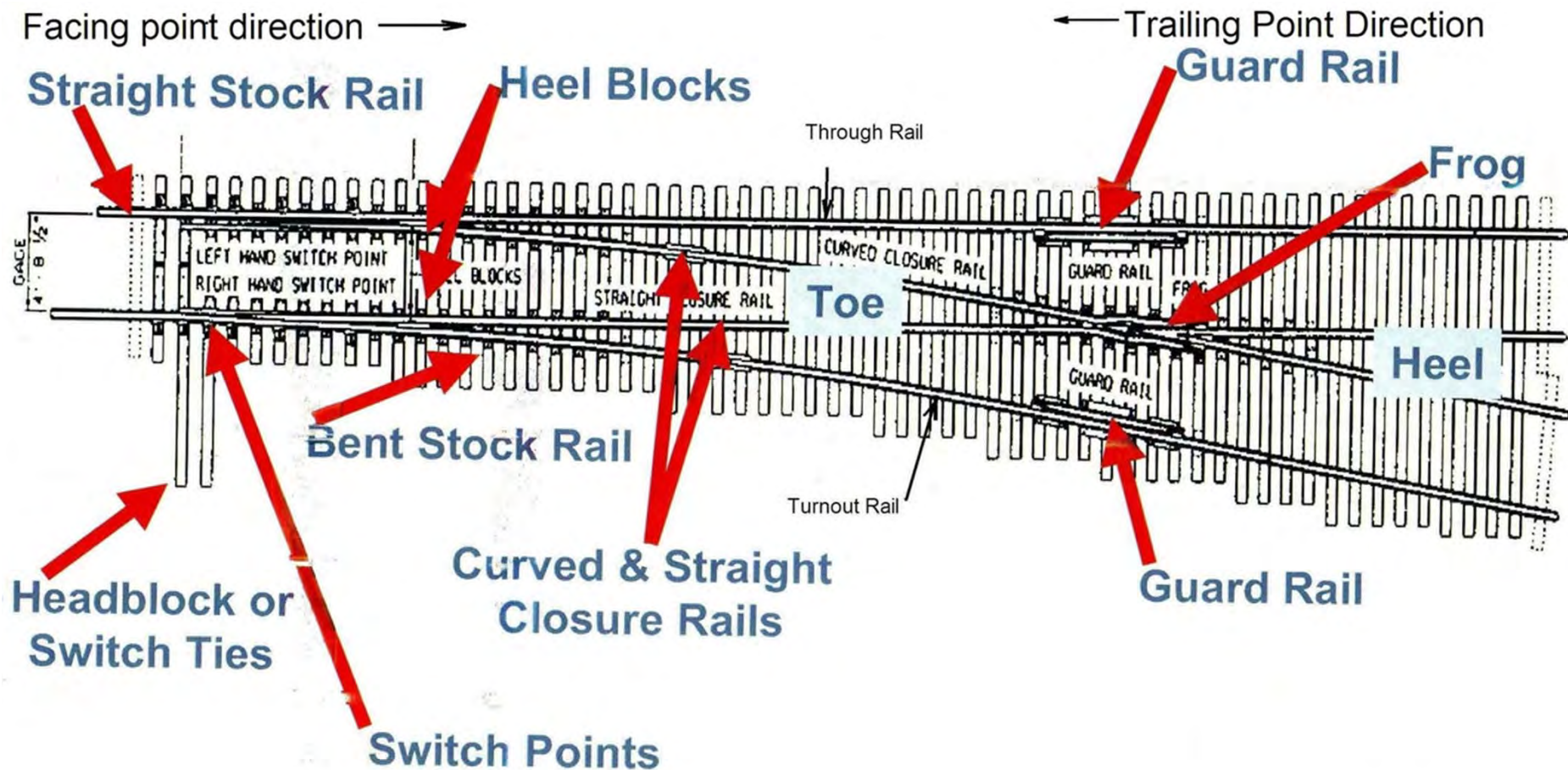


<u>Cause</u>	<u>Main</u>	<u>Other</u>
Gauge/ties	15%	16%
Switches	3%	27%
Buckles	9%	1%
Rail/joints	27%	17%
Surface	14%	6%
Equipment	12%	11%
Operations	11%	17%
Other	9%	5%



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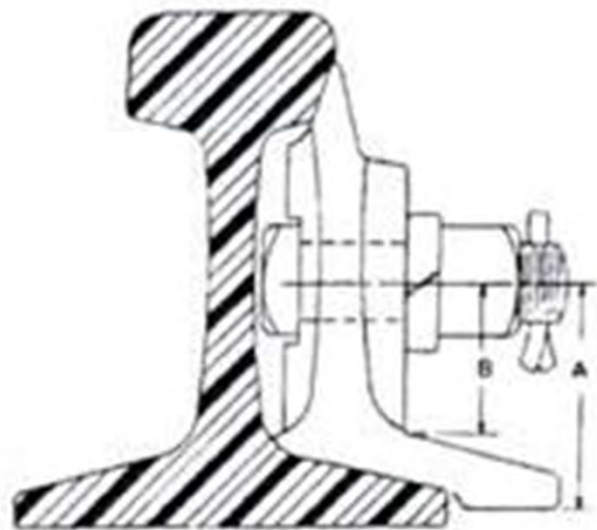
IN YARDS, IT IS ALL ABOUT THE SWITCHES AND LEADS



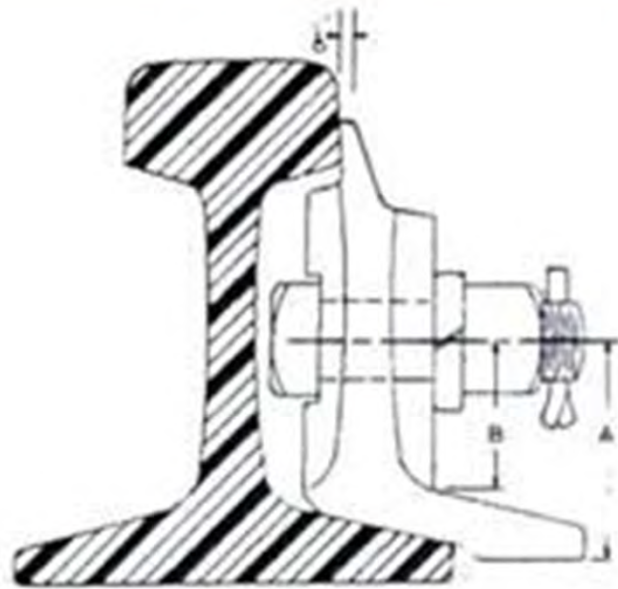


SECURE THE STAND FIRMLY
ERGONOMIC STANDS PREVENT BACK INJURY
USE LOCKS OR KEEPERS
CLEAN, REFLECTIVE, NUMBERED TARGETS
CHECK POINT PRESSURE





SAMSON DESIGN



STANDARD DESIGN

Sampson
design and
point
protector
\$8,500 per
turnout



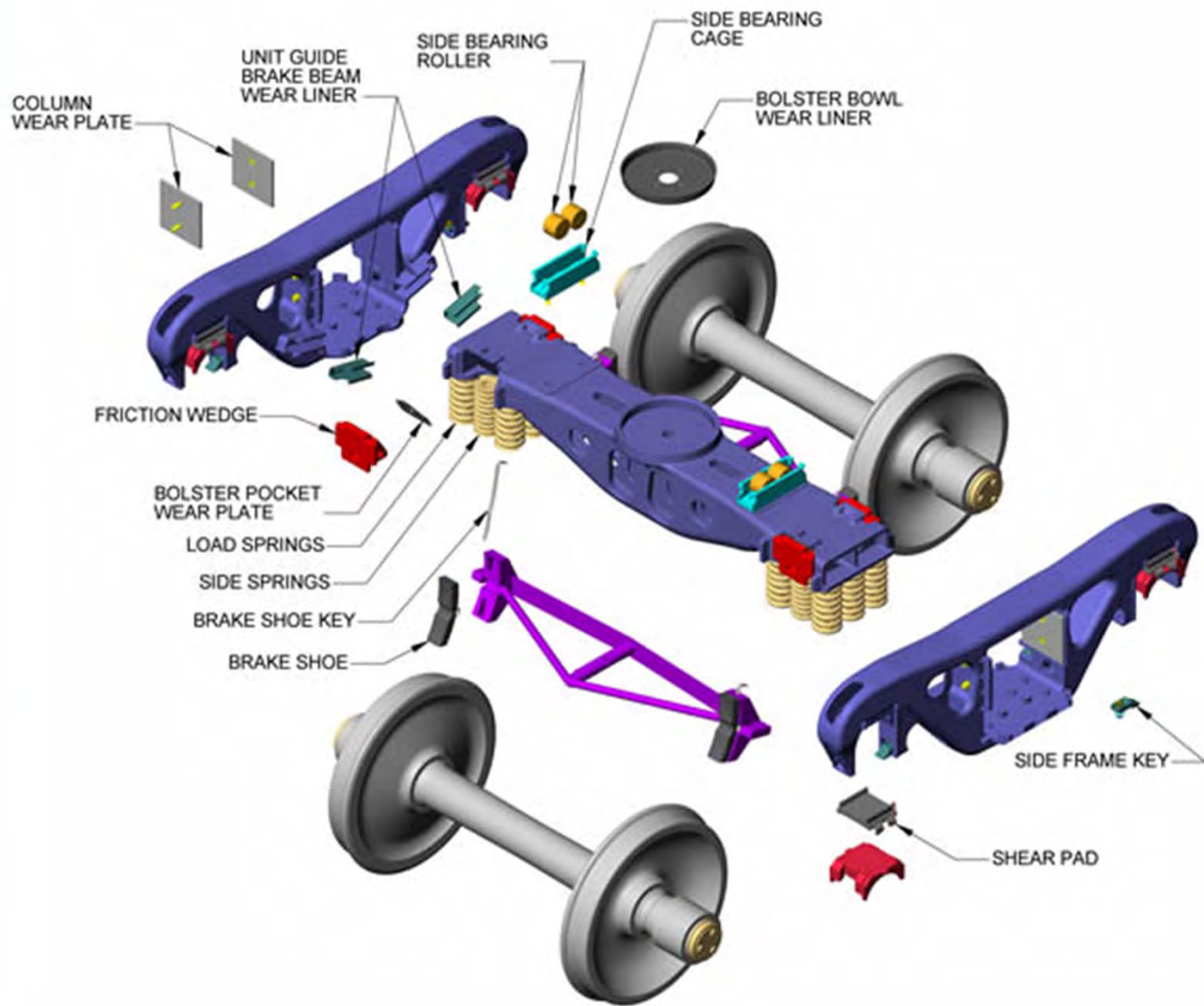






**TANKCARS ARE LONG AND RIGID
MORE EXPOSED TO X-LEVEL AND STEERING
FORCES**

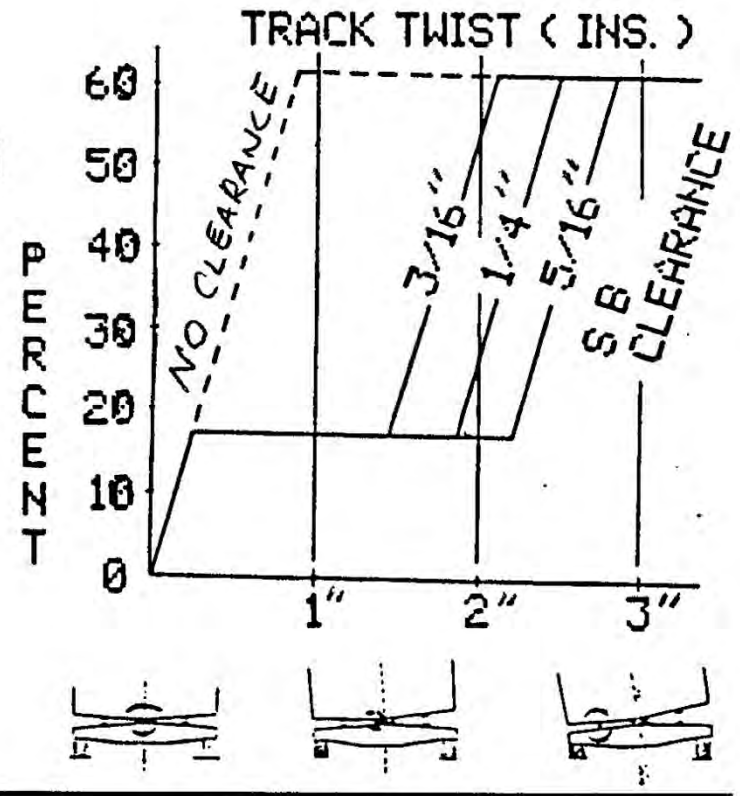




SIDE BEARING STDS

- AAR RULE 47
3/16" - 5/16"
- FEDERAL REG
0" - 3/4"

TYPICAL WHEEL UNLOADING DIAGRAM



CONSTANT CONTACT SB

< 4 7/8" > 5 1/4"

NO FEDERAL RULE ON TIGHT





Level track in curves and turnouts



A close-up photograph of a metal surface, likely manganese steel, showing signs of work hardening and grinding. The surface is dark and textured, with a prominent diagonal groove running across the center. The lighting highlights the rough, uneven texture of the metal, particularly along the edges and in the groove. The background is blurred, showing more of the metal surface.

MANGANESE STEEL DEFORMS
TO WORK HARDEN; GRIND IT!



- DON'T HIT THEM TOO HARD
- PUSH TO STOP
- LINE ALL SWITCHES
- STOP AND COUPLE
- USE TRACK LOCKOUTS



MANAGE RAILWAY IN INDUSTRIAL YARDS

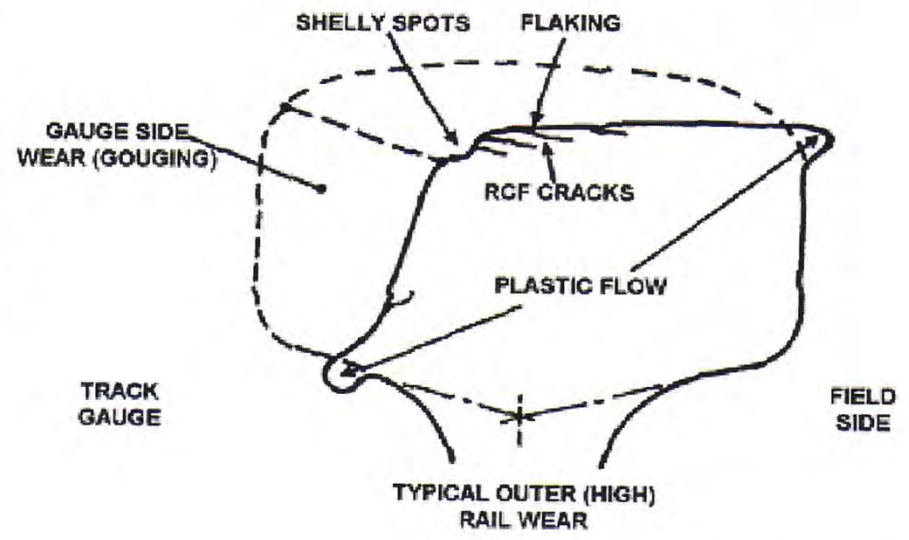
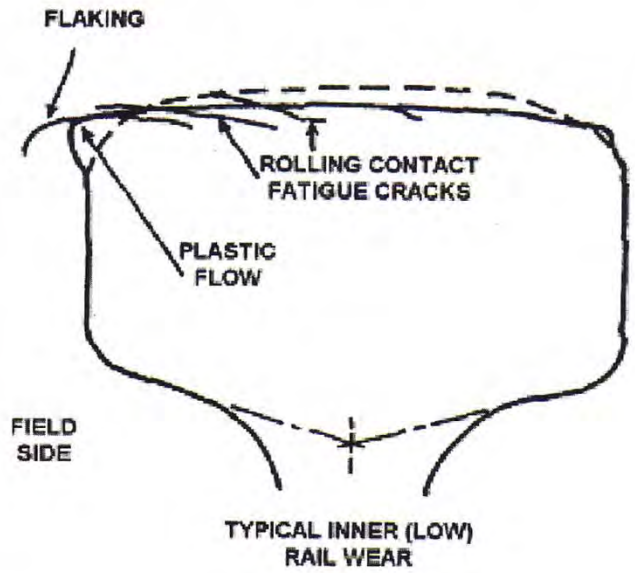
- IT IS ALL ABOUT THE SWITCHES
- CONTROLLED CAR MOVEMENT
- FOCUS ON HEAVY TRAFFIC LEADS
- FLAT CURVES – X-LEVEL DEFECTS
- DRAINAGE – TRACK SURFACE
- SPILL CONTROL
- HIGH STANDARDS FOR TRACK MAINTENANCE
- WRITTEN INSPECTION/REPAIR REPORTS – KEEP INVENTORY CURRENT
- ROOT CAUSE INVESTIGATION OF ALL INCIDENTS



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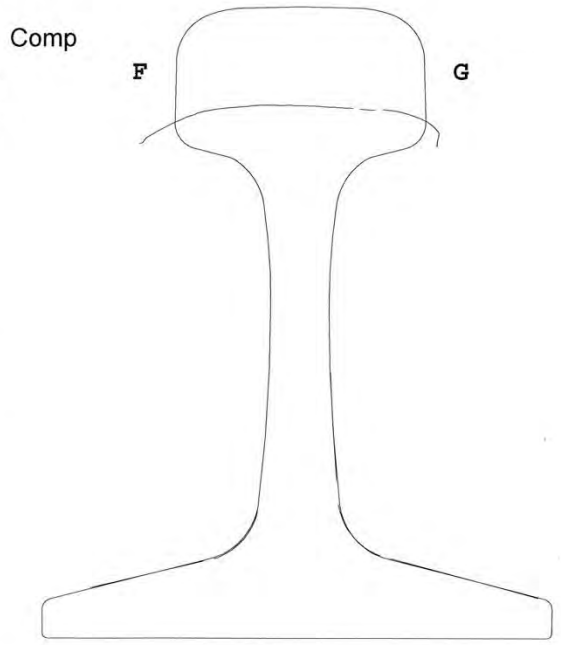


un/Sequence: Measured 6/1236
 Run Date: May 11 1995
 Subdivision: CHETWYND

 Type: RE136
 Gauge: Unknown
 Mile: 466.53 mi
 Side: West

 Head Loss: 65.39 %
 Vertical Wear: 28.74 mm
 Gauge Wear: 0.00 mm
 Field Wear: 0.00 mm
 Gauge Lip: 4.45 mm
 Field Lip: 10.31 mm

 Cant: -1.5 deg
 Classification: SCRP



Wear the rail to the web, **IF** you control the fatigue failures



KPI'S - MEASURE SUCCESS BY REDUCTION OF SERVICE FAILURES

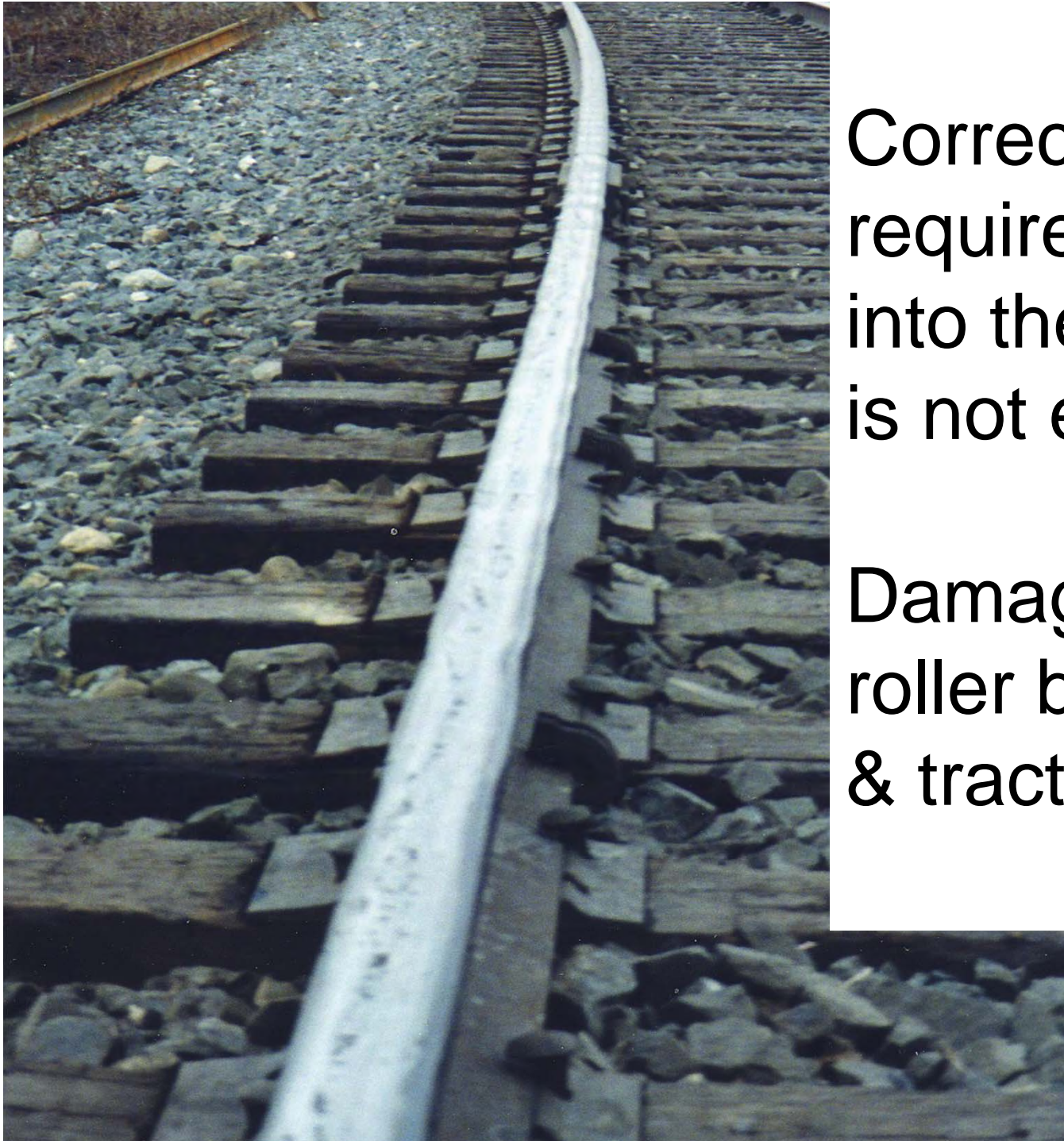
MONITOR DETECTED AND FAILURE DEFECT SIZES

- SMALL > LARGE
- LENGTHS OF VSH
- LENGTHS OF HWO
- SIZE OF BOLT HOLE CRACKS
- DEFECT CLUSTERS



- GATHER AND EXAMINE THE TESTING/FAILURE DATA TO PLAN TESTING FREQUENCY – LINK TO ACCUMULATING TONNAGE - GET AHEAD OF THE CURVE
- FOCUS ON THE “HOT SPOTS” TO GET THE DEFECT SIZE AND DEFECT FREQUENCY PER TEST REDUCED; DIRECTIONAL TESTING
- PLAN FOR SEASONALITY OF DEFECTS





Corrective grinding
required so deeply
into the rail that it
is not economic

Damage to
roller bearings
& traction motors



Grinding maintains; lubrication sustains

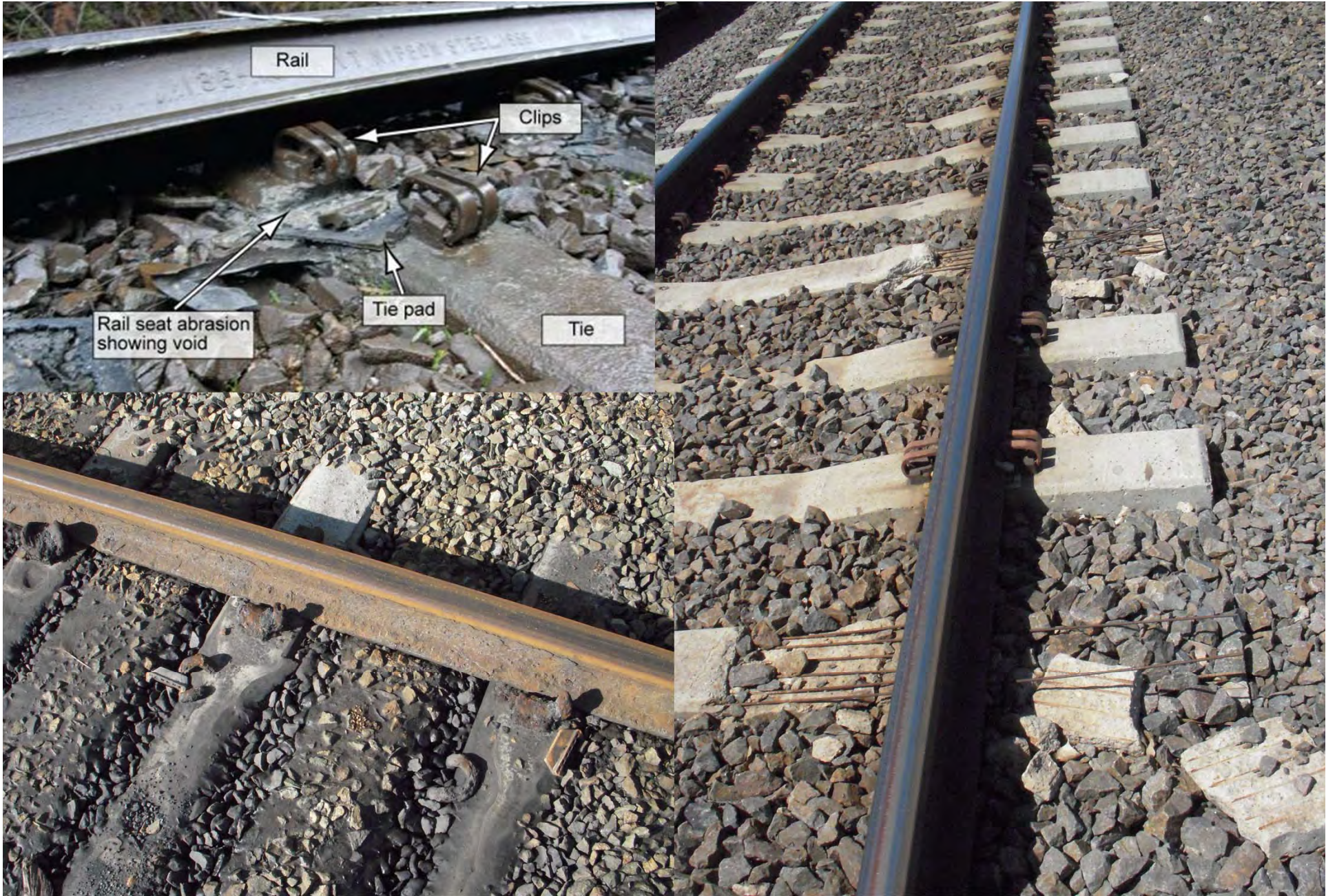


ALL TIES FAIL

THEY FAIL FASTER WITHOUT
MAINTENANCE AND IF THEY ARE BEING
OVERLOADED .

DESIGN FOR THE LOADS AND USE
PREMIUM FASTENINGS ON SHARPER
CURVES





Steel tie wear and fatigue cracking





KPI's - MANAGE THE GAUGE AND CROSS-
LEVEL ON CURVES

- TIE COUNTS (CYCLES: DEFER VS.
EFFICIENCY)

FRICITION MODIFIERS EXTEND CURVE
TIE LIFE



MANAGE RAILWAY MAIN TRACK

- IT IS ALL ABOUT THE CURVES
- STAY AHEAD OF RAIL FATIGUE DEFECTS
- MANAGE TIE CONDITION
- USE PREMIUM COMPONENTS
- DRAINAGE – TRACK SURFACE
- HIGH STANDARDS FOR TRACK MAINTENANCE
- WRITTEN INSPECTION/REPAIR REPORTS
– KEEP INVENTORY CURRENT
- ROOT CAUSE INVESTIGATION OF ALL INCIDENTS



TRACK MATERIALS MAKE UP ~65% OF
A (COMPLETED GRADE) TRACK
PROJECT BUDGET

BUY THE MATERIALS DIRECTLY TO
SAVE MONEY AND ENSURE QUALITY
AND THE BEST TURNOUTS. (ON ANY
PROJECT OVER \$200K); PROVIDES
CONTRACTOR CONTROL

BALLAST



PLAN WORK TO TAKE ADVANTAGE OF:

- SEASONALITY
- CLASS 1 BUDGET CYCLES
- CONTRACTOR COMMITMENTS
- CONTRACT EXTENSIONS
- EXTRA WORK FOR SPECIAL MOVES; ENSURE TRACK TIME

LONG LEAD TIME FOR SPECIAL TRACK WORK



THE CONSTRUCTION CONTRACT
MUST INCLUDE TOLERANCES

NOT USUALLY FOUND IN CLASS 1
SPECIFICATIONS

CAN NOT USE FRA/TC SAFETY
STANDARDS

COMPETENT DESIGN/INSPECTION



MANAGE LOWER CAPITAL COSTS

- BUY OWN TRACK MATERIALS
- SEASONALITY ADVANTAGES
- COMPETENT CONTRACTOR
- ENSURE TRACK TIME
- EXTRA WORK FOR SPECIAL MOVES
- PLAN BALLAST SUPPLY
- COMPETENT INSPECTION





