

Managing Capacity Increases in Heavy Haul Port Trackage

By Norman Hooper P.Eng.
Hooper Engineering



THE RAILWAY BUSINESS IS
BOOMING DUE TO THE
UPSURGE IN RAW MATERIAL
EXPORTS.



THERE IS A SHORTAGE OF
AVAILABLE EXPORT CAPACITY
IN COAL, POTASH AND OTHER
COMMODITIES



CLASS 1 RAILWAYS ARE
REQUIRING SHIPPERS AND
PORTS TO INCREASE THEIR
RAIL TERMINAL CAPACITIES TO
ACCEPT LONGER AND HEAVIER
TRAINS.

PORTS ALSO WANT MAXIMUM
THROUGHPUT



THIS PRESENTATION WILL

PART 1: DISCUSS KEY ACTIONS
TO REDUCE INDUSTRIAL YARD
DERAILMENTS.

PART 2:
PROVIDE TECHNIQUES TO
LOWER THE CAPITAL COST OF
TRACK EXPANSIONS AND
UPGRADES





THE COST OF FAILURE IS HIGH

DERAILMENTS:

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



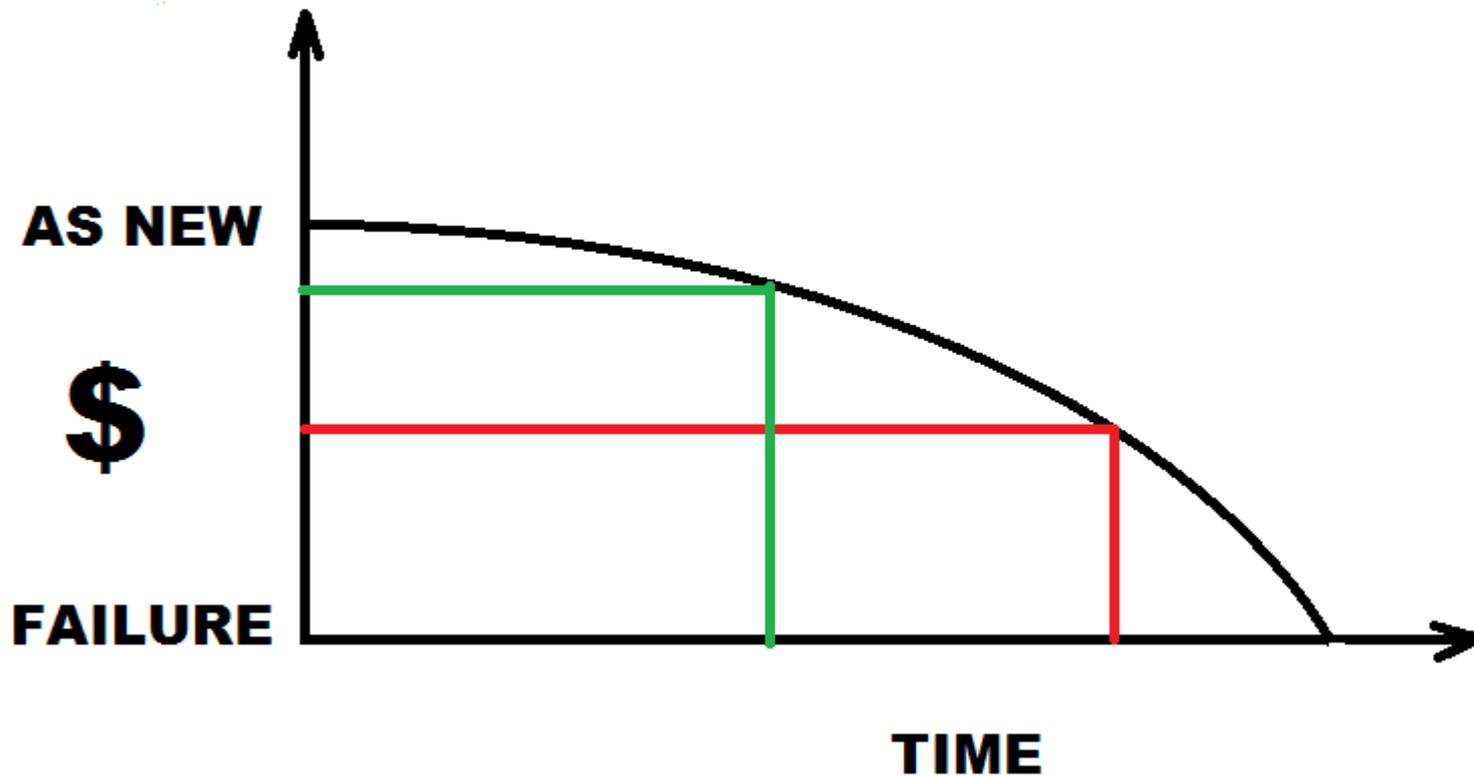
WHAT HAS THE DERAILMENT
EXPERIENCE/HISTORY BEEN?

WAS A THOROUGH ROOT CAUSE
INVESTIGATION PERFORMED?

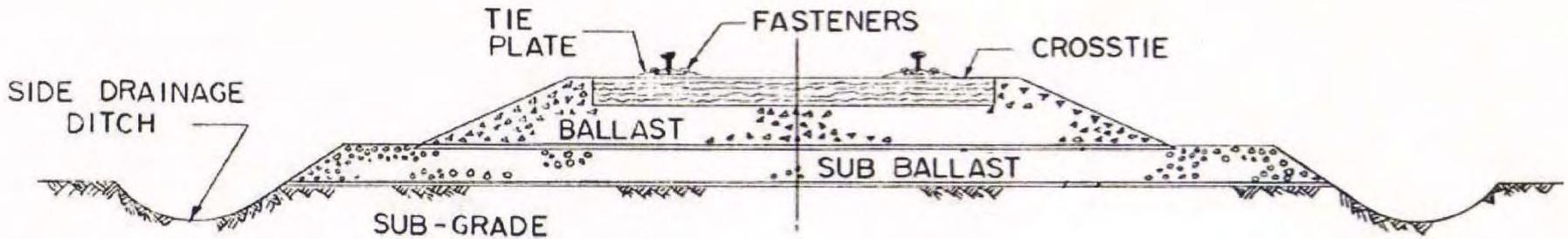
RISK ASSESSMENT FOR
UPGRADES - WHAT IS THE IMPACT
OF TRACK OUT-OF-SERVICE?



DON'T DEFER MAINTENANCE



IN HEAVY HAUL SERVICE
TIMELY MAINTENANCE DELIVERS THE
LOWEST LIFE CYCLE COST



Typical Track Cross Section

CONSTRUCTION & MAINTENANCE STARTS WITH THE DRAINAGE





DESIGN/MAINTAIN THE DRAINAGE







PUMPING TRACK = FASTENER FAILURE



WHAT'S THE TIE AND FASTENER
CONDITION OF THIS TURNOUT?



YOU CAN'T TAMP MUD !



HEAVY HAUL
PORT YARDS
MUST BE
MAINTAINED
TO HIGHER
STANDARDS

NOT JUST FRA
CROSS-TIE
SAFETY
STANDARDS



**LOADING IS
SHIFTED TO THE
GOOD TIES**

**DETERIORATION
ACCELERATES**

FRA Data Derailment Averages for Industrial Track

- 50% cross ties
- 25% turnouts
- 25% everything else
(snow/ice, operations, rails, etc.)





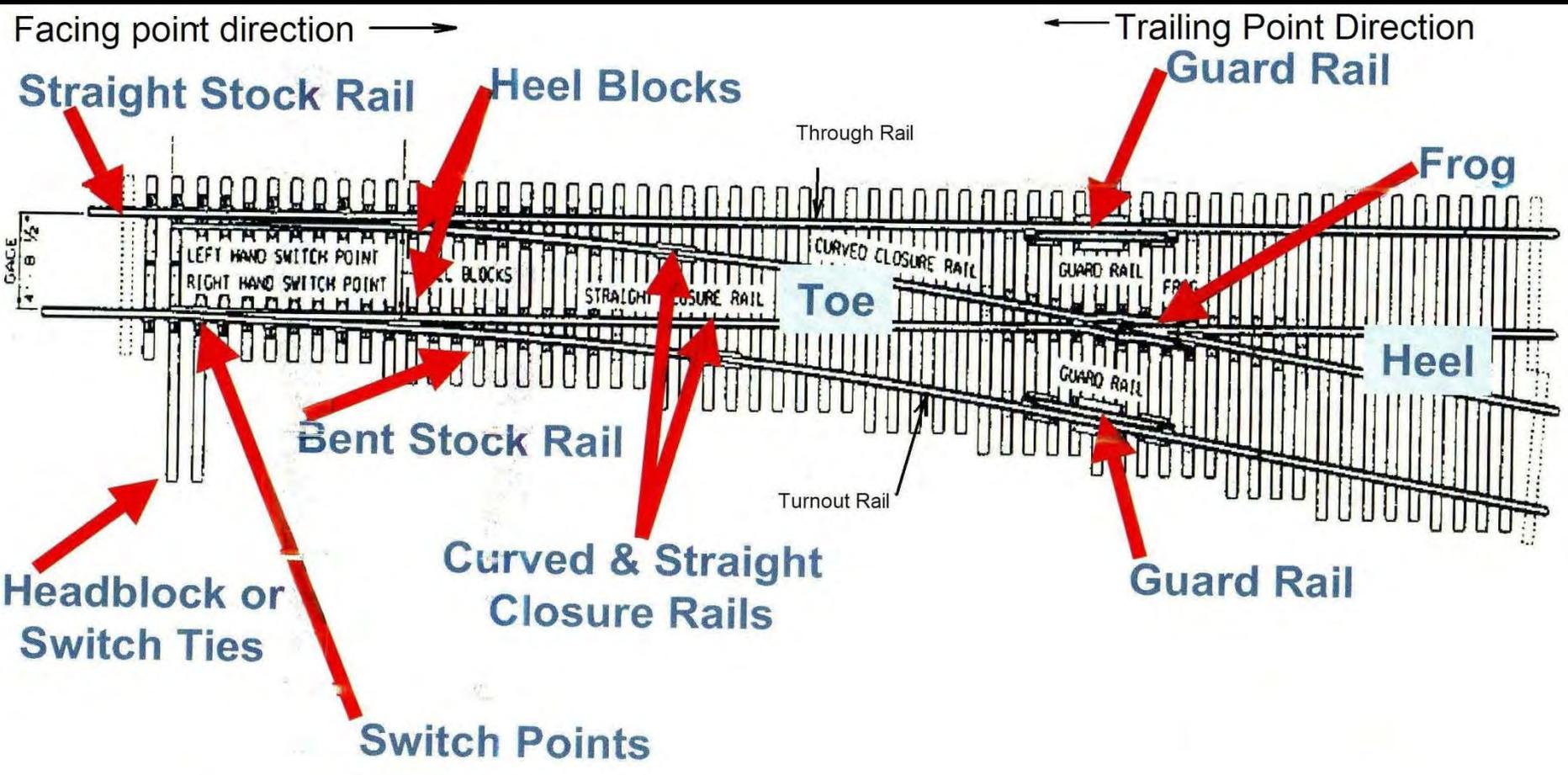
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IN MY EXPERIENCE, MOST HEAVY HAUL YARD DERAILMENTS OCCUR AT TURNOUTS

USE LOCKS OR KEEPERS



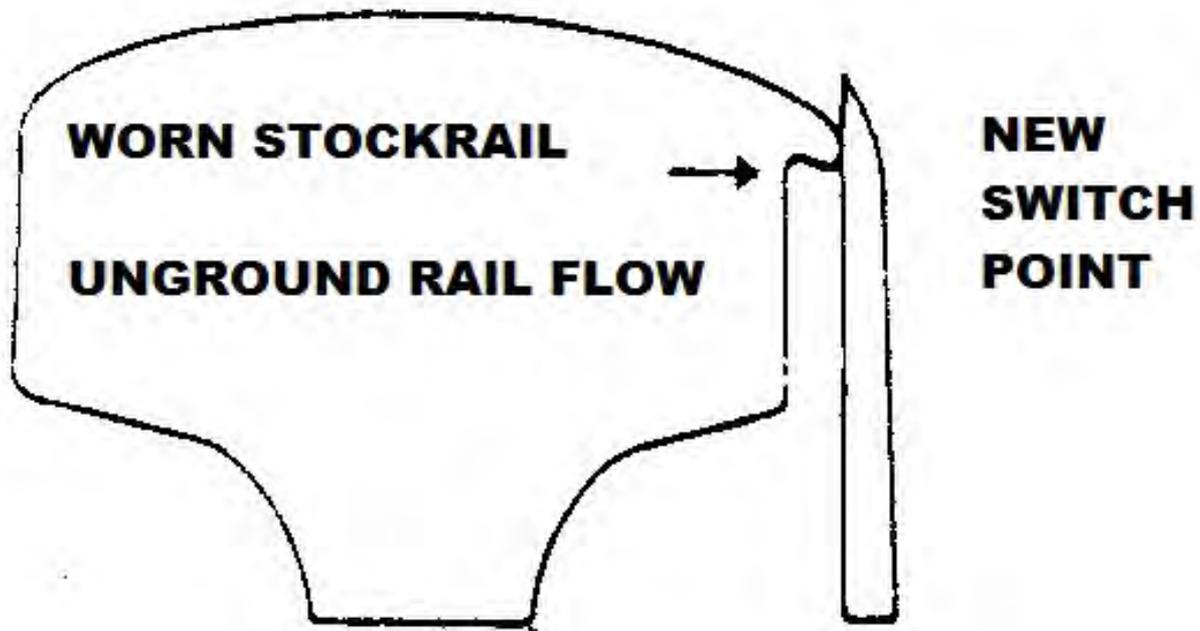
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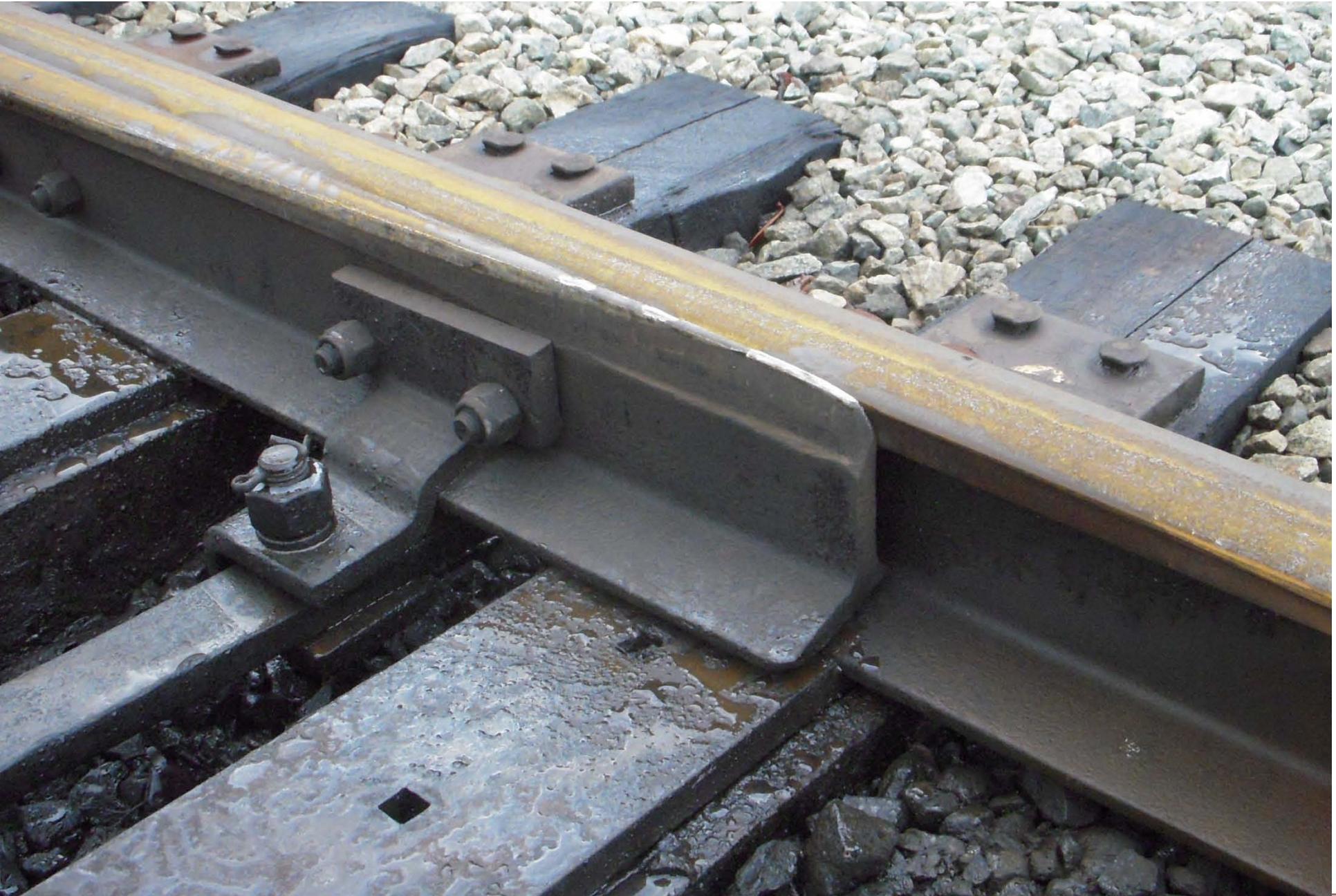


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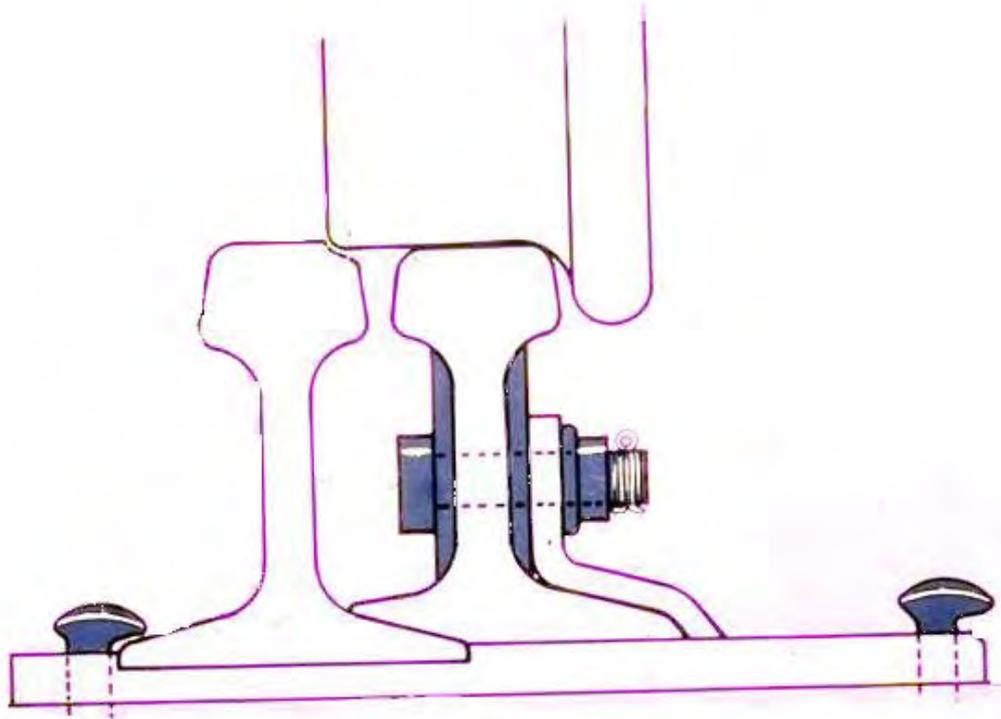






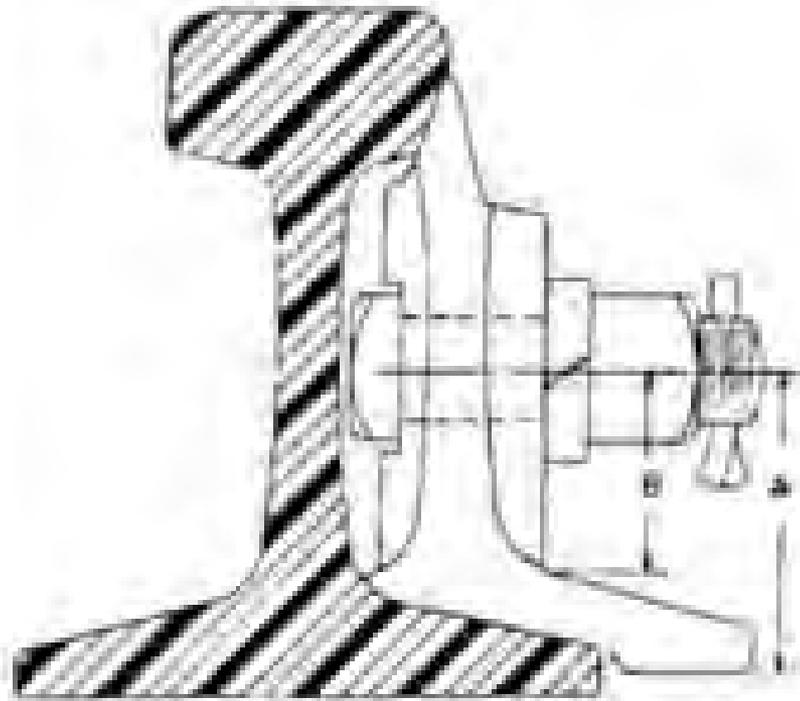
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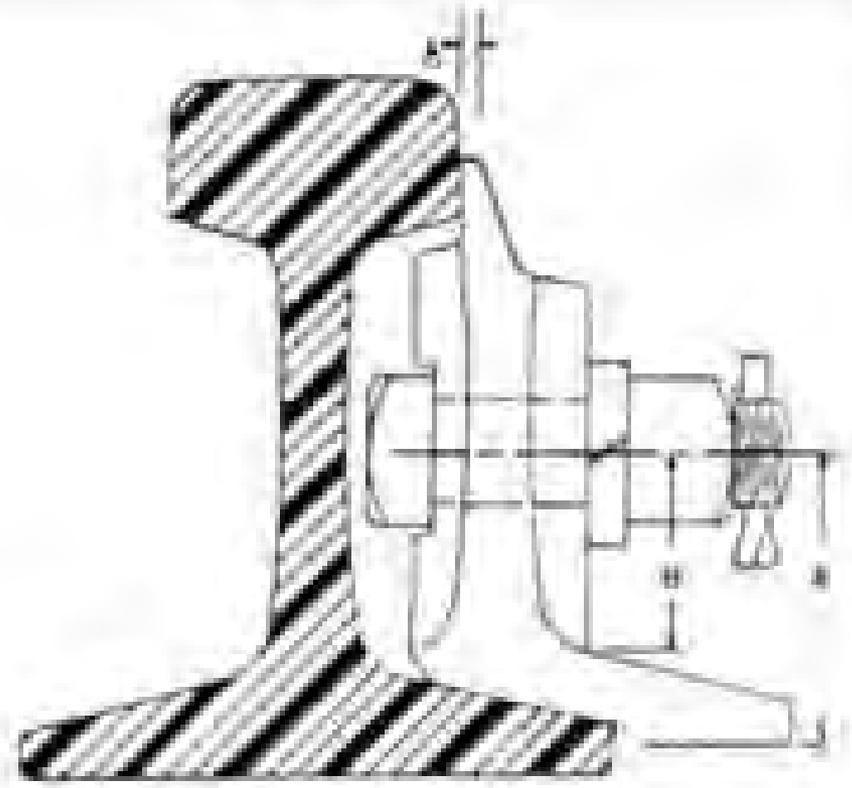


$\frac{1}{4}$ " VERTICAL AT $4 \frac{1}{2}$ " WIDTH





SAMSON DESIGN



STANDARD DESIGN

\$6,000 PER TURNOUT





NOR
42-
132



~\$2500 PER TURNOUT



24.07.2009 15:05





**GRIND!
GRIND!
GRIND!**

MANGANESE STEEL DEFORMS
TO WORK HARDEN



ELASTIC FASTENERS

REMOVE FROG
FOR SHOP
WELDING

GRIND!
GRIND!
GRIND!





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**BROKEN BARS AND LOOSE BOLTS
WILL BE IN THE MAIN LEADS**



USE CWR IN NEW CONSTRUCTION

DERAILMENT PREVENTION IN A HEAVY HAUL YARD

- INDEPENDENT INSPECTOR WITH WRITTEN REPORTS
- WEEKLY INSPECTION OF TURNOUTS AND MAIN LEADS
- FULLY INVESTIGATE INCIDENTS



DERAILMENT PREVENTION IN A HEAVY HAUL YARD

- MAINTAIN THE DRAINAGE
- GRIND POINTS AND FROGS
- UNDERCUT STOCKRAILS
- POINT PROTECTORS
- CWR ON NEW CONSTRUCTION

- **KEEP UP ON MAINTENANCE**



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TRACK EXPANSIONS AND
UPGRADES



PORT TRACKAGE EXPANSION IS ALSO BEING DRIVEN BY THE RAILWAYS EFFORTS TO INCREASE THROUGHPUT.

INCREASED TRAIN LENGTHS AND HEAVIER CARS MEAN MORE TONS IN A "TRAIN SLOT"



THIS IS MORE EFFICIENT USE
OF RAILWAY LOCOMOTIVES
AND CREWS

IT REQUIRES THE RAILWAYS
TO BUILD SIDING EXTENSIONS
ON SINGLE MAIN TRACK



THE RAILWAYS ARE REQUIRING CHANGES BY THE SHIPPERS AND PORTS

- RECEIVE AND RETURN THE TRAIN AS A UNIT
- MINIMUM RAILWAY SWITCHING
- LOCOMOTIVES PROPERLY POSITIONED TO DEPART
- 7 X 24 SECURE OPERATION



EXPANSION ISSUES FOR THE PORT HAVE LONG LEAD TIME:

- LIMITED LAND
- PERMITTING
- DRAINAGE
- ENVIRONMENTAL
- ARCHAEOLOGICAL
- UTILITIES

ENGAGE A WELL EXPERIENCED ENGINEERING FIRM





SOMETIMES EASY



MOSTLY EXPENSIVE



DID I MENTION UTILITIES?
AS-BUILTS AREN'T.

EXPANSION ISSUES CON'T:

- SHIPPER & PORT "FOOT-PRINTS" ARE BASED ON HISTORIC TRAIN LENGTHS
- DUMPER/STORAGE CAPACITIES USUALLY EXPANDED; PRODUCT MIXING
- EFFECT OF CONSTRUCTION ON OPERATION



THE PRODUCT HANDLING COMPONENT REPRESENTS THE PORT'S MAJOR UPGRADE COST AND IS WHY THE ENGINEERING FIRM IS USUALLY SELECTED.

ENSURE THE ENGINEERING FIRM/TEAM BRINGS DESIGN STRENGTH IN TRACK DESIGN, CONSTRUCTION AND TRAIN OPERATIONS





IT IS DIFFICULT TO GET "TRACK TIME"
IN BUSY TERMINALS
THIS DRIVES THE SCHEDULE AND THE
WORK PLAN



TRACK LAYOUT
TO ACCEPT
LONGER TRAIN
LENGTHS AND

SITE
RESTRICTIONS
AND
CONSTRAINTS





23.04.2009



CURVATURE CAUSES HIGHER
FORCES WHEN THE RAILCAR
TRUCKS TURN

HIGHER CURVATURE INCREASES
MAINTENANCE & DERAILMENT
RISK

MITIGATE BY USING PREMIUM
COMPONENTS & LUBRICATION



DESIGN CHOICES

LOWER INITIAL CAPITAL COST:

- BASIC TURNOUT DESIGN
- SECOND HAND MATERIALS
- LESS BALLAST
- LOWER QUALITY TIES
- MORE MAINTENANCE AND SHORTER LIFE



DESIGN CHOICES

LOWEST LIFE CYCLE COST

- PREMIUM TURNOUT COMPONENTS
- MAIN TRACK STANDARDS IN TIES, RAIL AND BALLAST

SENIOR MGT UNDERSTANDING IN THE BUDGET PHASE



TRACK MATERIALS MAKE UP
~65% OF A TRACK PROJECT
BUDGET

TO SAVE MONEY BUY THE
MATERIALS DIRECTLY FROM
THE SUPPLIERS ON ANY
PROJECT OVER \$200K



MATERIAL - USED OR NEW?

- INSPECT FOR WEAR IN PLATES





MATERIAL - USED OR NEW?

- INSPECT FOR WEAR IN PLATES
- DO ANCHORS STILL HOLD
(SPRUNG AND BASE WEAR)
- RAIL DEFECTS AND MISMATCH
- JOINT BAR CRACKS AND
WEAR



MATERIAL - USED OR NEW?

- TURNOUTS - HOOK PLATES, SOFTER FROGS, POINTS
- NOT MUCH INVENTORY DUE TO THE HIGH PRICE OF SCRAP
- USED MATERIAL COST RUNS +70% OF NEW MATERIAL



THERE ARE SUFFICIENT TRACK SUPPLIERS TO PROVIDE COMPETITIVE BIDS

USE AREMA STANDARDS OR THE STANDARDS OF THE CLASS 1 SERVICING THE FACILITY

DELIVERY CAN BE ARRANGED BY:

- RAIL, IF SPACE PERMITS
- BY TRUCK JIT (CROSS-TIES)



THE CONSTRUCTION CONTRACT
MUST INCLUDE TOLERANCES

NOT USUALLY FOUND IN CLASS 1
SPECIFICATIONS

CAN NOT USE FRA SAFETY
STANDARDS

CONSIDER WEAR IN SH MATERIAL



DIRECT TENDER FOR TRACK WORK RATHER THAN THROUGH A GENERAL SITE CONTRACTOR

- PRE-QUALIFY BIDDERS
- CONSIDER NO BONDING IF PURCHASING THE MATERIAL
- \$10M INSURANCE, ACTS AS A QUALIFIER



BALLAST

- CLASS 1 SUPPLY OF BALLAST BY HOPPER?
- LAY BASE LIFT OF BALLAST BY TRUCK PRIOR TO TRACK CONSTRUCTION
- CHECK LOCAL SUPPLIER CAPABILITIES





EXTRA WORK

ENSURE A COMPREHENSIVE
LIST OF EQUIPMENT,
MANPOWER AND MATERIAL
PRICES ARE IN THE TENDER
FOR THE LIFE OF THE
CONTRACT



DO THE COMPLICATED TIME SENSITIVE ACTIVITIES AS EXTRA WORK

- EXTRA EQUIPMENT WILL BE AVAILABLE IN CASE OF BREAKDOWN
- PORT OPERATIONS DELAYS ARE PAID AUTOMATICALLY
- TIMING CONTROLLED
- ASSUME SOME RISK AND SAVE





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PLAN WORK TO TAKE ADVANTAGE OF:

- SEASONALITY
- CLASS 1 BUDGET CYCLES
- CONTRACTOR COMMITMENTS
- CONTRACT EXTENSIONS



REDUCE CAPITAL COSTS

- BUY TRACK MATERIALS
- SEASONALITY ADVANTAGES
- COMPETENT CONTRACTOR
- EXPERIENCED ENGINEER
- IS BONDING NEEDED?
- EXTRA WORK FOR SPECIAL MOVES
- PLAN BALLAST SUPPLY
- COMPETENT INSPECTION





IT IS A SMALL INDUSTRY IN MANY WAYS

PAY YOUR BILLS ON TIME

TREAT CONTRACTORS AND SUPPLIERS FAIRLY



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