![High Output Track Renewals logo] [Network Rail logo]

Using Technology to Improve Safety within High Output:

Safe & Efficient Access

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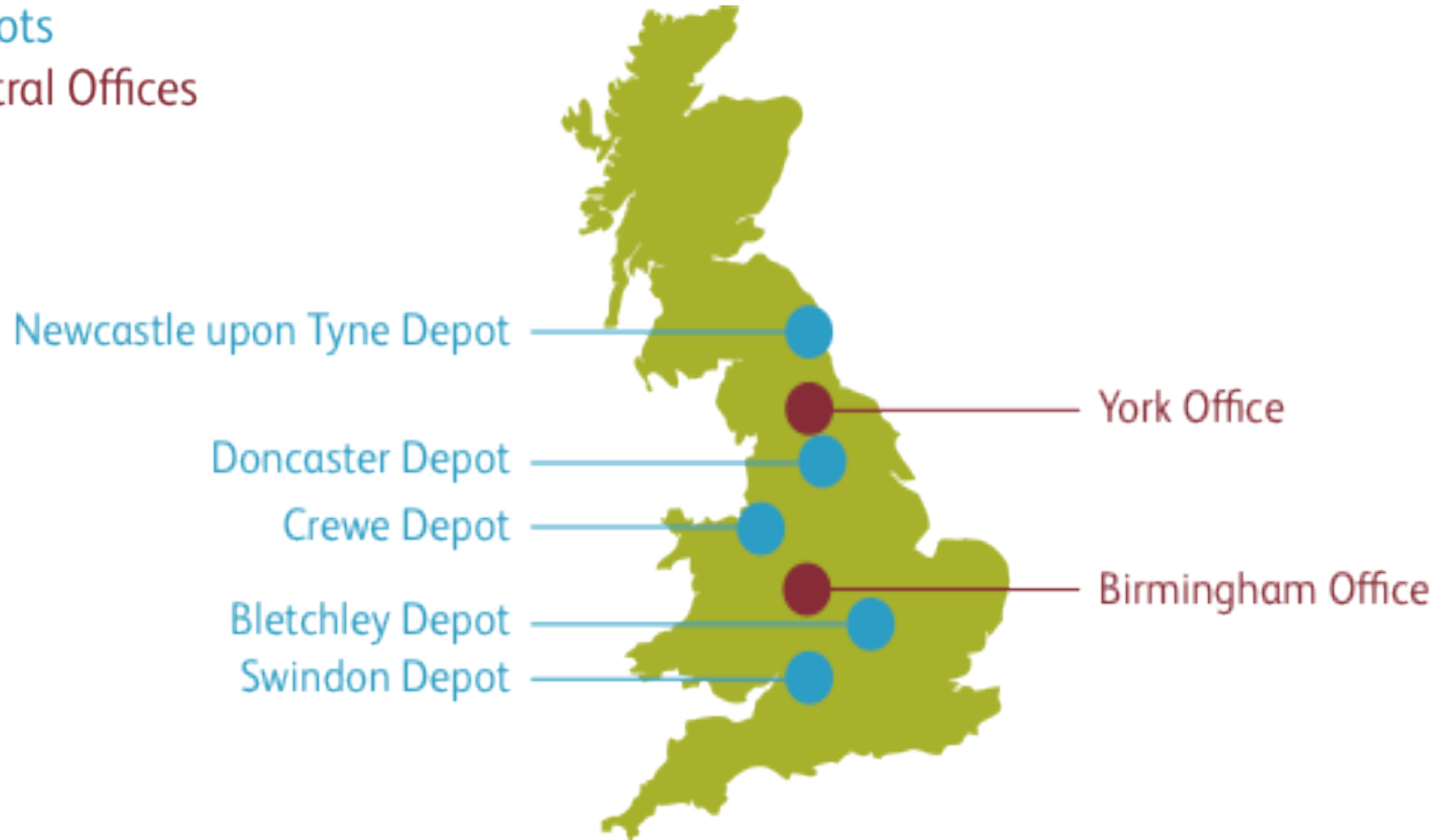Director of Engineering, Design & Improvement

Introduction

- Network Rail High Output Fleet:

  2 Track Relaying Systems (TRS)

  5 Ballast Cleaning Systems (BCS)

- Deploy 5 nights/week, with adjacent lines open and typically handing back at 100mph.

- Delivering 70% of plain line linear volume in Great Britain in CP5 (Apr 2014 – Mar 2019).

Offices & Depots

5 Depots
2 Central Offices

Newcastle upon Tyne Depot
York Office
Doncaster Depot
Crewe Depot
Birmingham Office
Bletchley Depot
Swindon Depot

NetworkRail

High Output
Track Renewals
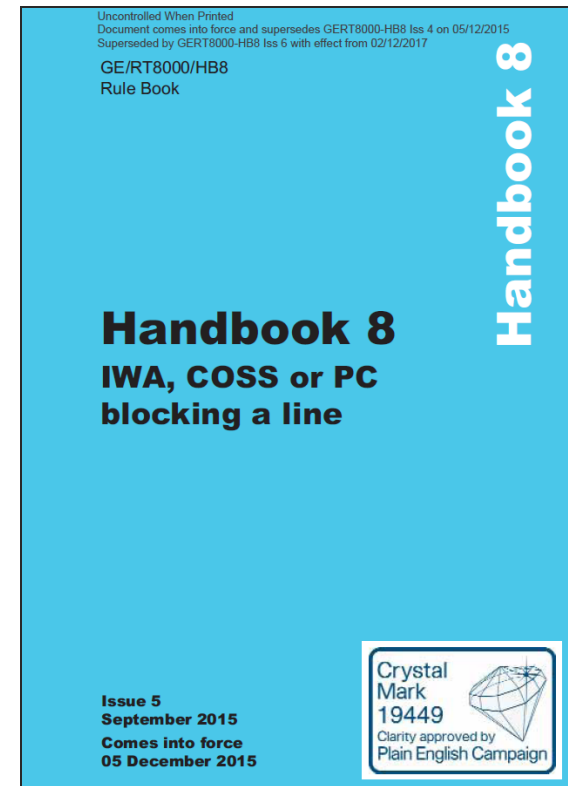
Blocking the Line:
The Need to Change….

Current Protection Methods for Line Blockages

Handbook 8 of the rule book describes the process for taking a Line Blockage:

1. The signaller arranges for a protecting signal to be placed to danger

2. Signaller installs reminder appliance on the panel.

If safety of the line is affected then a form of additional protection is required:

a) Signal disconnection

b) Detonators and Possession Limit Board (PLB)

c) Installation of a Track Circuit Operating Device (TCOD)

Uncontrolled When Printed
Document comes into force and supersedes GERT8000-HB8 Iss 4 on 05/12/2015
Superseded by GERT8000-HB8 Iss 6 with effect from 02/12/2017

GE/RT8000/HB8
Rule Book

Handbook 8

Handbook 8
IWA, COSS or PC blocking a line

Issue 5
September 2015
Comes into force
05 December 2015

Crystal
Mark
19449
Clarity approved by
Plain English Campaign

Problems with the Current Arrangements

- Protection methods require staff to be lineside.

- Complicated and relies on multiple 1 to 1 verbal communications

- Many parties all with different roles and responsibilities

- The method that tends to be the preferred option is PLB's and detonators. The activity is:

   − Potentially hazardous requiring staff to enter the 4' every time.

   − Slow and time consuming utilising valuable working time

Safety Stats – Operational Close Calls

- RAIL INDUSTRY 2017-18 YTD - **157** operational close call incidents relating to Line blockages.

- *Protection incorrectly placed*

- *Miscommunication between COSS and Signaller*

- *Miscommunication between COSS and Possession support staff*

- *Signaller error*

The High Output Safe & Efficient Access Project

Aims of the Safe & Efficient Access Project

- To create a step change improvement in safety by removing staff from the 4 foot when placing and removing protection.

- To reduce the amount of time taken to take and handback blockages of the line (possessions and line blockages)

everyone
home safe
every day

A better railway for a better Britain

Line Blockages within High Output

- High Output activities require line blockages of the adjacent line varying from 5-15 minutes per night.

  - 12 x Line blockages for TRS

  - 6 x Line blockages for BCS

- All of which affect safety of the line and require a form of additional protection.

<u>The preferred method of additional protection for High Output has been detonator protection.</u>

Recent Success in High Output

Introduction of ZKL3000 (RC)

Sponsored through Product acceptance by High Output

Mtinfo Reports

The difference to TRS since Introducing ZKL

NetworkRail

PLB & Detonators

Signaller

Protecting Signal

PC / COSS & Workgroup

Hand Signaller

STOP

WORK

ZKL3000 (RC)

Signaller

Protecting Signal

PC / COSS & Workgroup

WORK

ZKL
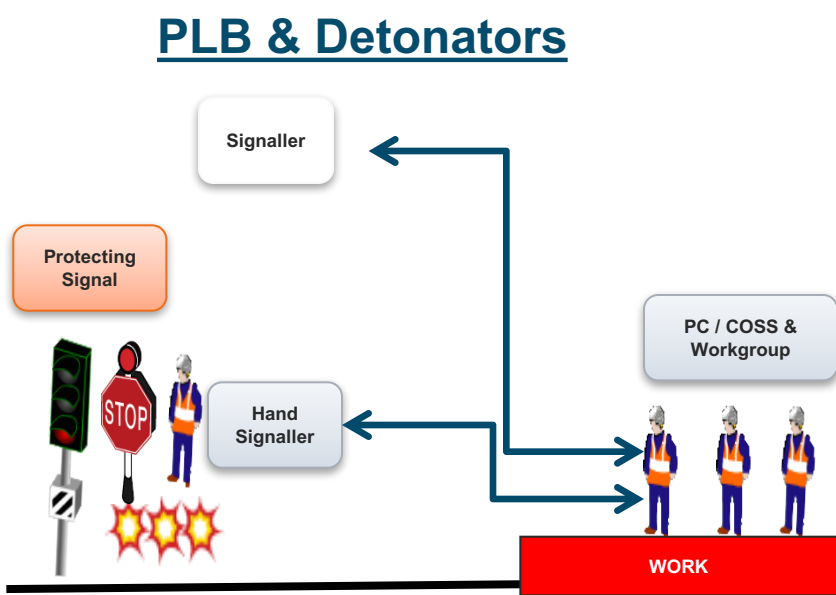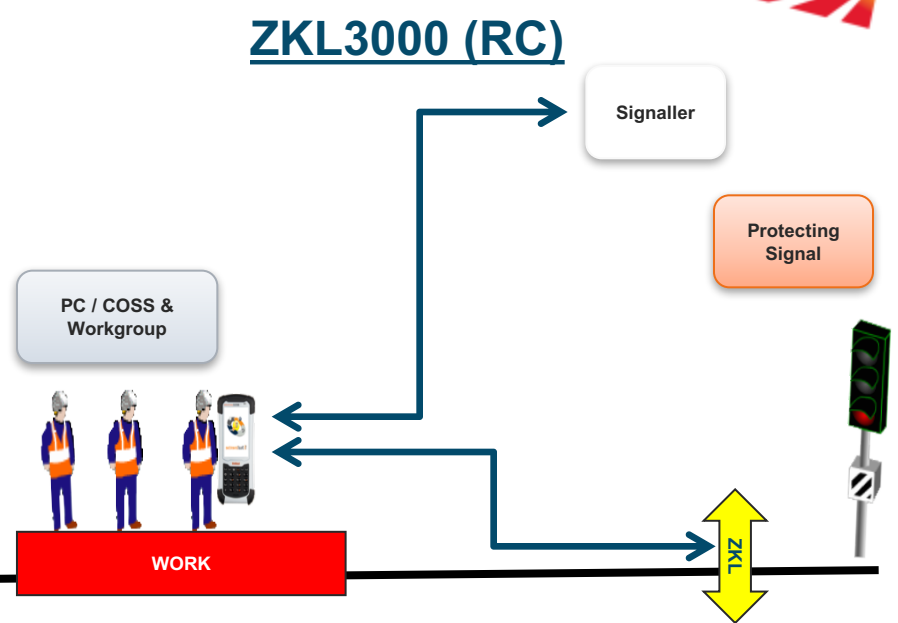
Day	Line Blocks Req	Using PLB and Detonators as additional Protection			Using ZKL3000 (RC) as additional Protection		
		Visits to the 4 foot	No. of Phone calls	Average time taken to place and remove protection	Visits to the 4 foot	No. of Phone calls	Average time taken to place and remove protection
M	12	24 (2 per line block)	96 (8 per line block)	24 minutes	1 (install)	24	4 min
T	12	24	96	24 minutes	0	24	4 min
W	12	24	96	24 minutes	0	24	4 min
T	12	24	96	24 minutes	0	24	4 min
F	12	24	96	24 minutes	1 (remove)	24	4 min
Total	60	120	480	2 hours	2	120	24 mins

The Logic – ZKL Vs Conventional

Protection Type	Visits to the 4 foot (for 1 line blockage)	Communication (for 1 line blockage)	Time (for 1 line blockage)
PLB & Dets	1 to take 1 to handback 2 total	4 calls to take 4 calls to handback 8 total	2 mins to deploy and remove
ZKL3000 (RC)	installed once prior to shift	1 call to take 1 call to handback 2 total	20 seconds to deploy and remove

TRS

- **4 foot visits = reduced by 118 (97%) per week**

- **Phone Calls = reduced by 360 (75%) per week**

- **Protection time = reduced by 1 hour 36 mins per week**

BCS

- **4 foot visits = reduced by 58 (97%) per week**

- **Phone Calls = reduced by 180 (75%) per week**

- **Protection time = reduced by 48mins (80%) per week**

Summary

- **Reduced the risk of exposing staff to moving trains when placing / removing protection for line blockages.**

- **Reduced line blockage visits to the 4 foot by 97% per week per system**

- **Reduced the amount of phone calls for line blockages by 75% per week per system**

- **Gained additional 96minutes (TRS) and 48 mins (BCS) per week per system through introduction of ZKL3000 (RC)**

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every day

The future for High Output and Network Rail

- Incab Flexible Train Arrival Point (FTAP)

- ZKL3000(RC) mobile app

- ZKL's installed at fixed locations

- Tamping using ZKL3000 as protection

- High Output Protection Zone

- Personal Warning System (PWS)

- Wireless train warning system (SATWS, ATWS)

- Remote TSR Boards
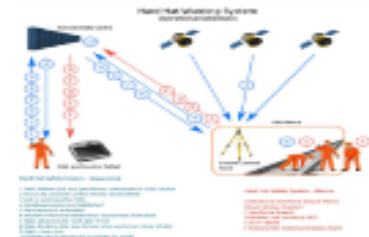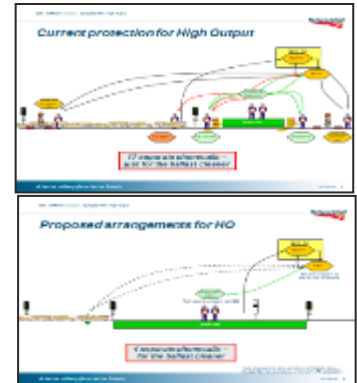
Thank you

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