



FELIX Deployment

The story so far !



Contacts:

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What is FELIX?

FELIX is an Automated Measurement Trolley for Switches and Crossings (S&Cs)



Semi-automated
and battery-
powered

Ergonomic
modular design

Scans every
2mm

Non-contact
technology
(cameras and
lasers))

What parameters does FELIX measure?

- Gauge
- Twist
- Twist over 3m
- Cross level
- P8 profile measurement
- Gauge 1 & 2
- Switch radius gauge
- Back-to-back gauge through moving parts of switch
- Switch opening throughout the length of the open switch
- Residual switch opening
- Switch toe squareness
- NR4 sidewear gauge
- Height difference between wing rail and crossing nose

7 Standard Job Numbers



What is FELIX?

Research and Development
Innovation is in our nature



CHANGE



Manual
Inspection



Use of
gauges



Decision
making

Change Parallels - The Banking Experience ...



Queueing at a bank



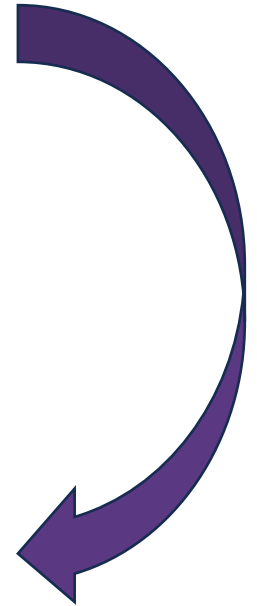
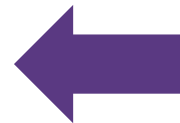
Queueing at an ATM



Using internet banking



Using card machines





Change – Manual Gauges to Precision lasers and cameras...

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Changing Ways of Working

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Project Achievements- 18 months



Product acceptance achieved



Formed a National FELIX Community of Practice



Four routes (three regions) selected for first in class deployment



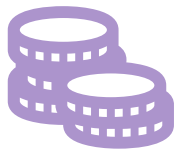
Successful Operational Demonstrator (January- May 2023)



Level 3 benefits case (Sussex)- submitted for review



Three units delivered and commissioned



Finalised negotiations with the supplier, Loccioni



Concluded at National and Route Maintenance Council



Competency decided and agreed (TR14 FELIX Operators)- currently being configured



Funding approval for x4 R&D units



Commissioned a Deployment Toolkit- guides for pre and post deployment- October



Enhanced comms strategy aimed at internal and external partners



Framework agreement and contract with the supplier has been signed



Security Assurance Case (SAC) and Data Protection Assurance System complete



X2 training courses delivered, 5 users trained

Unit Allocation

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All R&D-fund
across 2023 a
allocated

Dec

- Eng
- P

techn

We received a R
Proposal Form from one
route in every region...

**DEPLOYMENT COMMENCED
IN SUSSEX ROUTE**

2024

Sussex

Southern

Eastern

Scotland

Q4

X1 unit

Scotland

FELIX in Sussex



Sections:

Barnham
Horsham
Three Bridges

Croydon
Norwood
Victoria

Junctions:

Horsham
Redhill
Victoria Central
Victoria Eastern
Norwood
Tattenham Corner
Streatham Common

Tulse Hill
Dorking
Pulborough
Earlswood
Bromley
Sutton
Crystal Palace

5

Users
trained

26

Shifts
completed

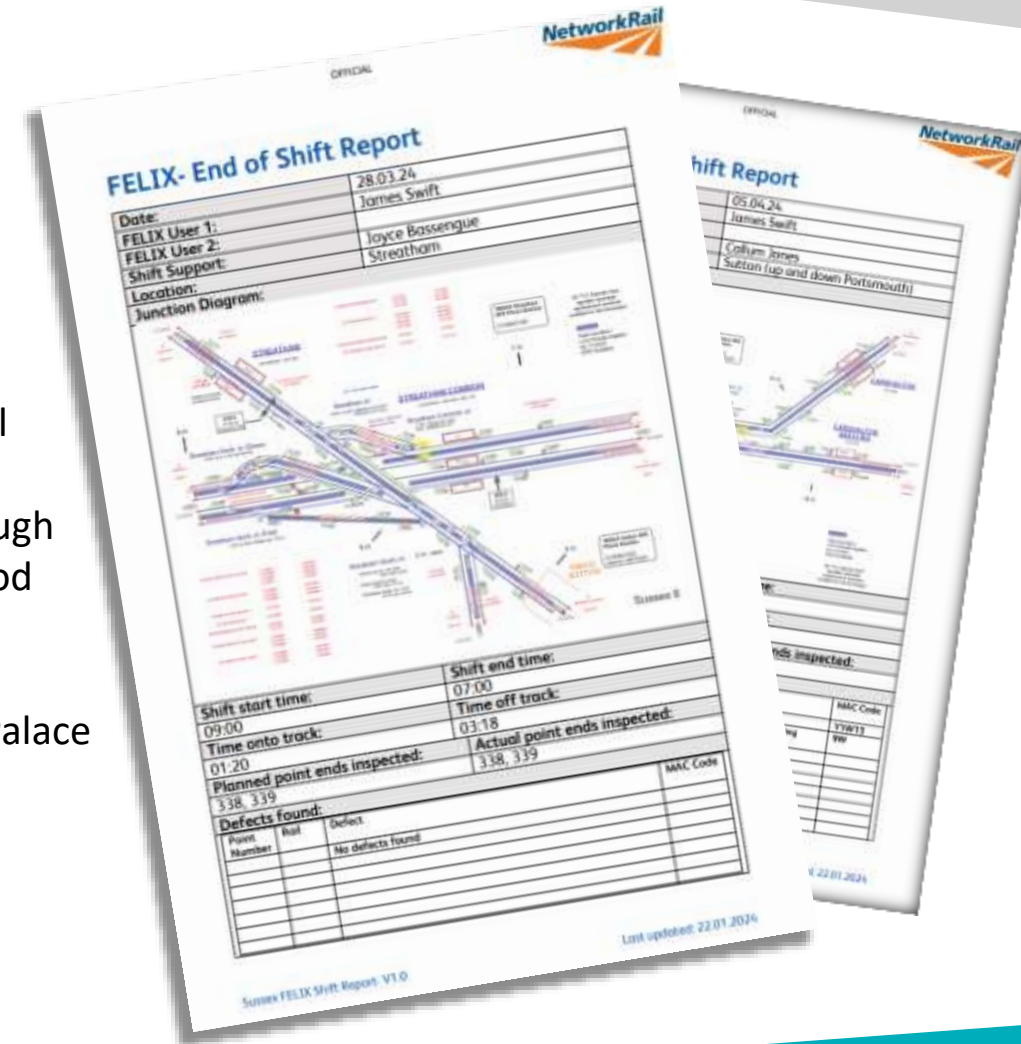
98

Defects found

Of which...

13

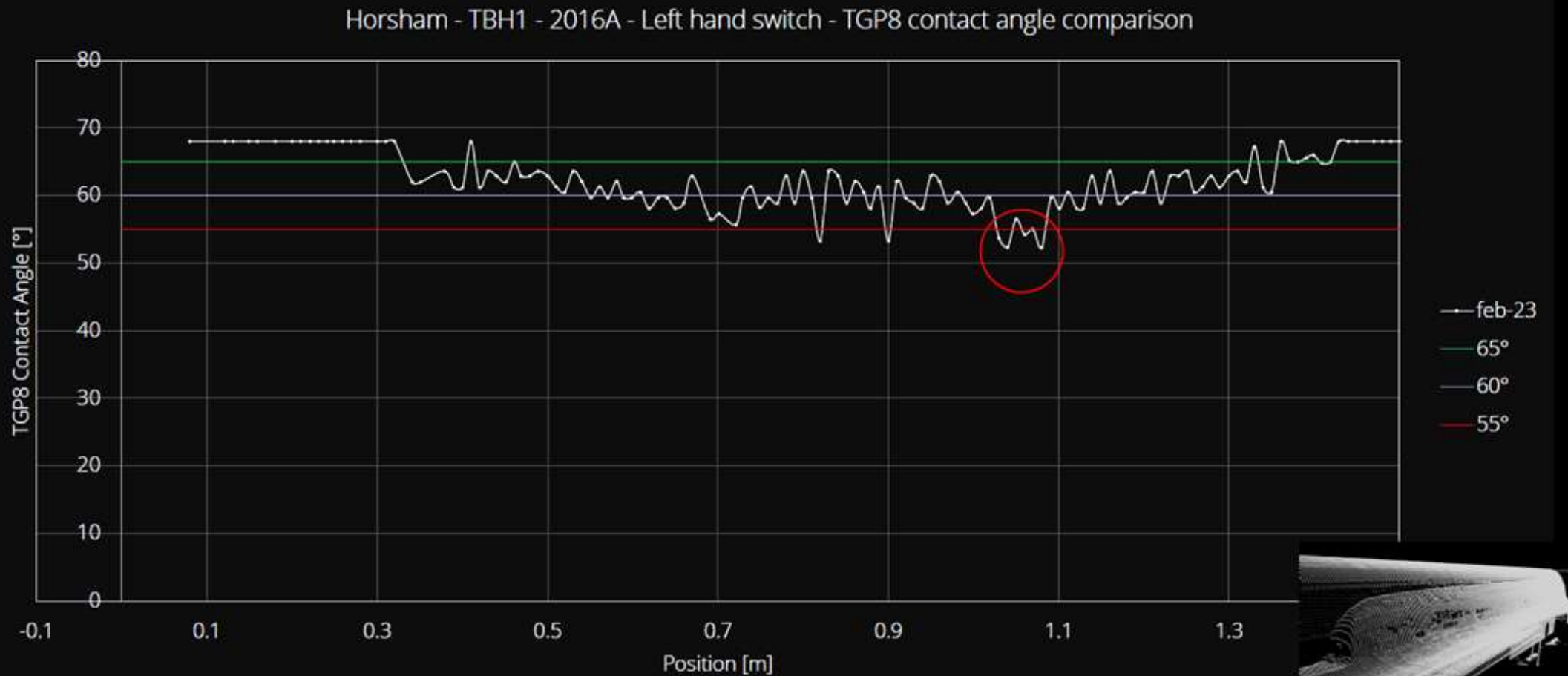
Ban to facing
moves



Case Study

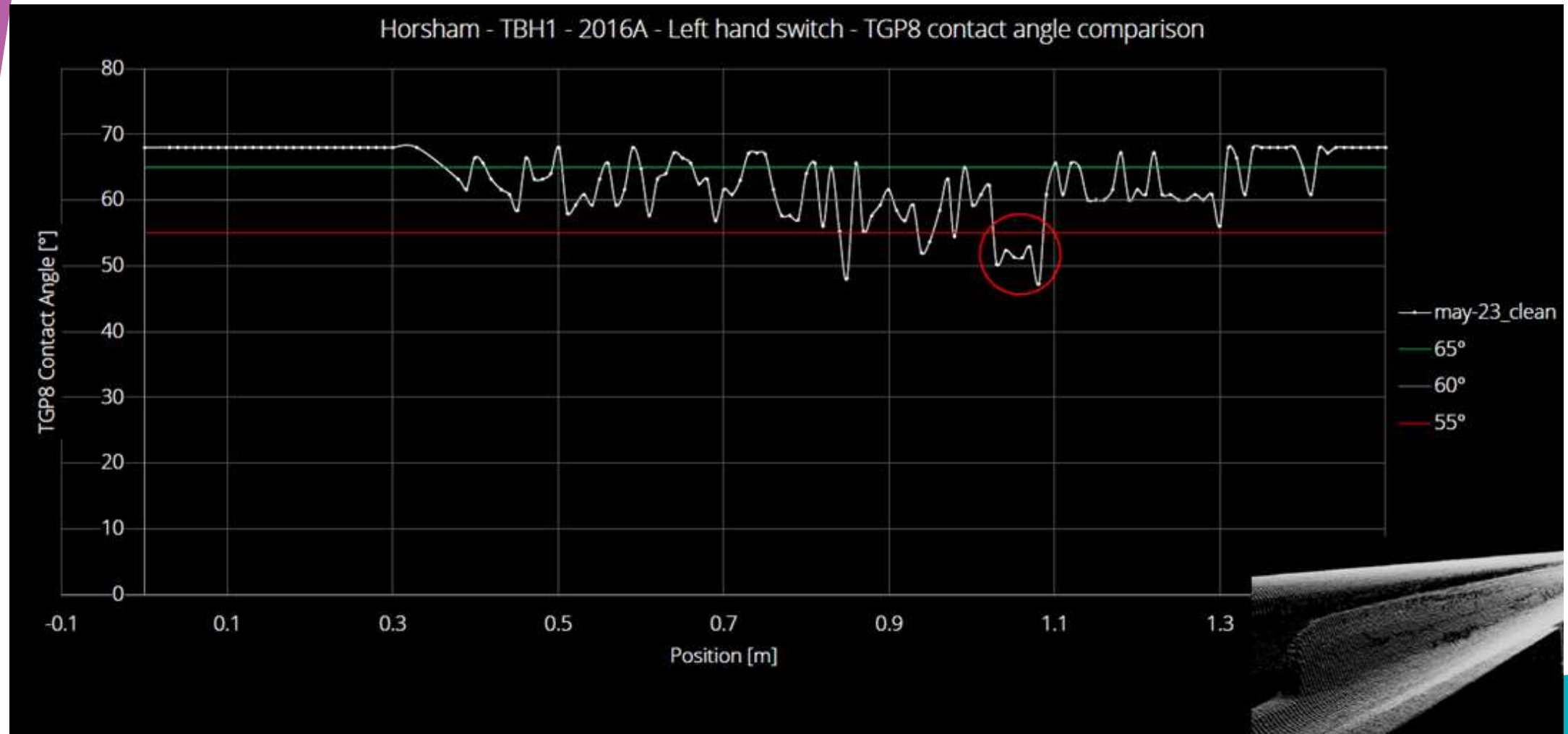
Horsham 2016A, Feb 23

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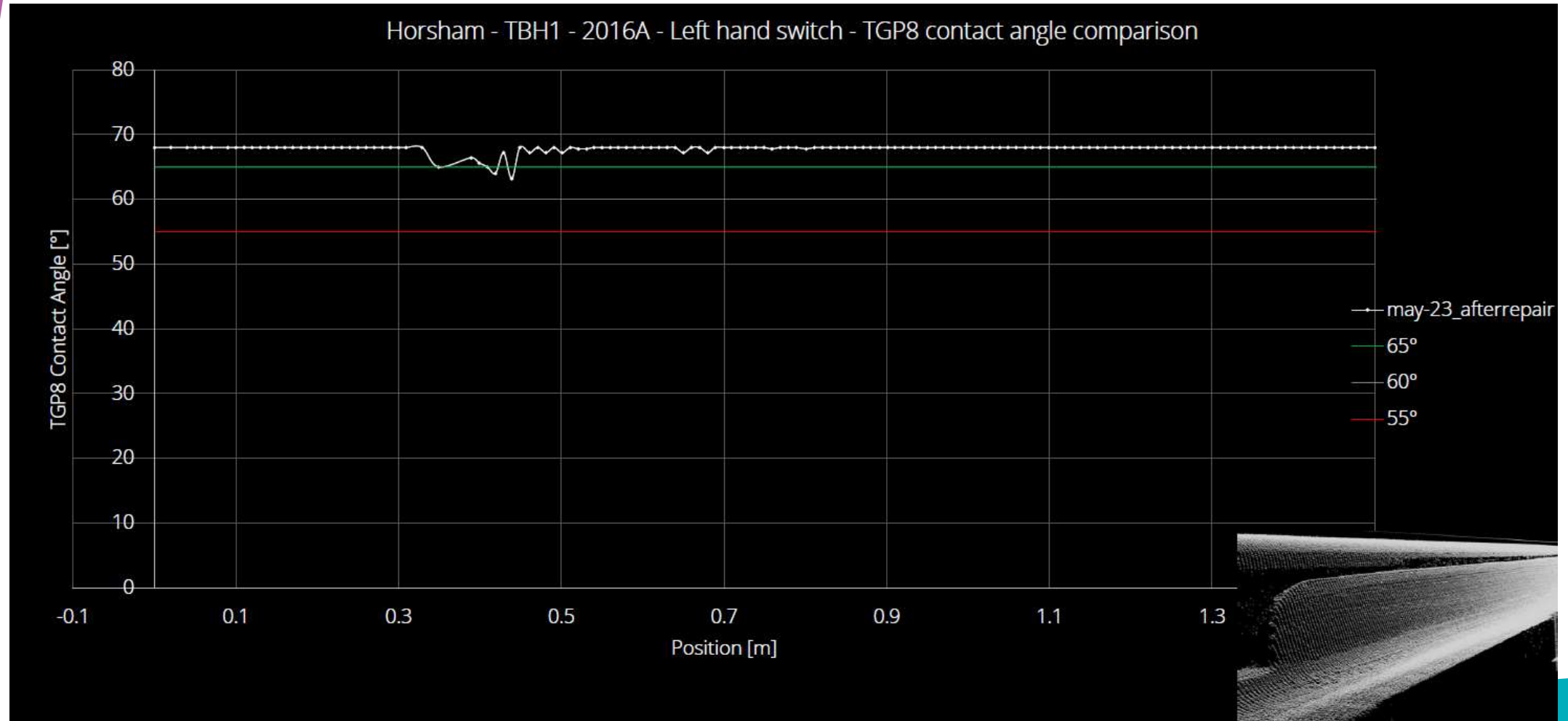
Case Study

Horsham 2016A, May 23



Case Study

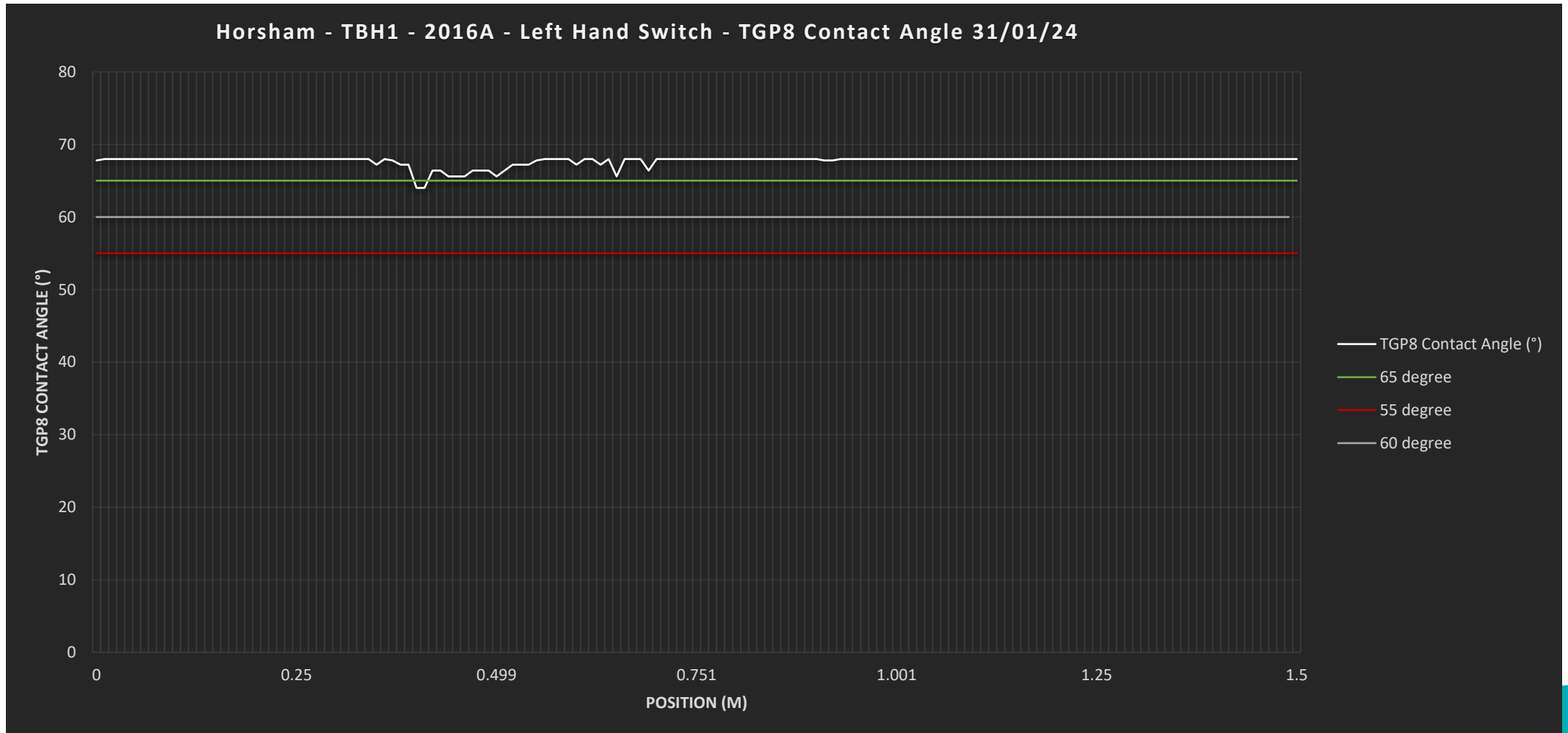
Horsham 2016A, May 23 – After grind repair



Case Study

Horsham 2016A, Jan 24

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Sussex Successes

- Accurately and objectively identifying defects so they are visible in the system
- Developing more efficient working practices
- Completing mentorship of newly trained staff
- Promoting confidence in the technology
- Working with sections to complete MST inspections
- Positive working relationship with the supplier
- Proactiveness from the users and the project team

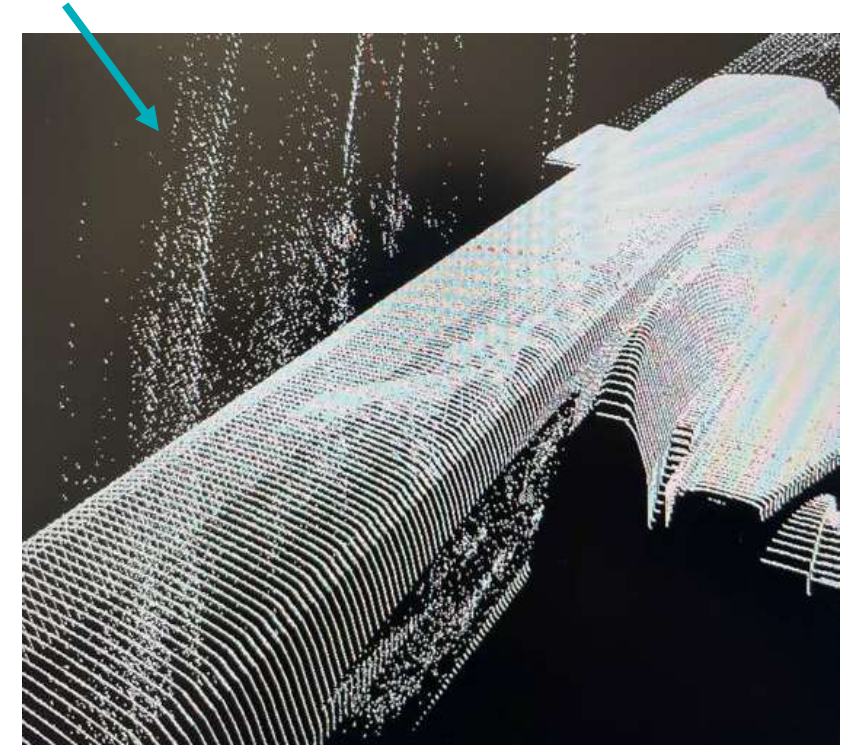


- ✓ Improving asset condition
- ✓ Extending asset lifespan
- ✓ Increasing safety (of both assets and individuals)
- ✓ Increasing productivity and efficiency
- ✓ Provision of more consistent, accurate, and detailed data
- ✓ Adding to staff competencies
- ✓ Alleviating workload pressures



Sussex Issues

- Technical issues
 - Working with Loccioni to improve the functionality (of both the hardware and software)
- Heavy grease at certain locations
 - Wheel flange modification to be retrospectively fitted to all units
- Reflections affecting the camera (due to direct bright sunlight)*
 - Software update to rectify this issue
- Lack of trained staff
 - Additional training sessions held
- Competence not live with Network Rail
 - Competence has been agreed, it is currently being configured onto Oracle
- Lack of location knowledge visiting locations for the first time
 - Building up site knowledge to improve planning and efficiency on shift



*Reflections affecting camera

Future Plans in Sussex



Looking at the possibility of forming a dedicated team.



Training more staff to be able to use the equipment which will increase productivity and efficiency in shifts.



Improve planning of shifts to increase visibility



Dedicated van for transportation making the equipment more secure and safe in transit.



Develop information packs on lessons learnt from first deployment to help subsequent deployments in other routes.



Record plain line black holes, all track geometry measurements that we currently measure can be recorded with another add on module.



Update Standards to separate from manual gauge,

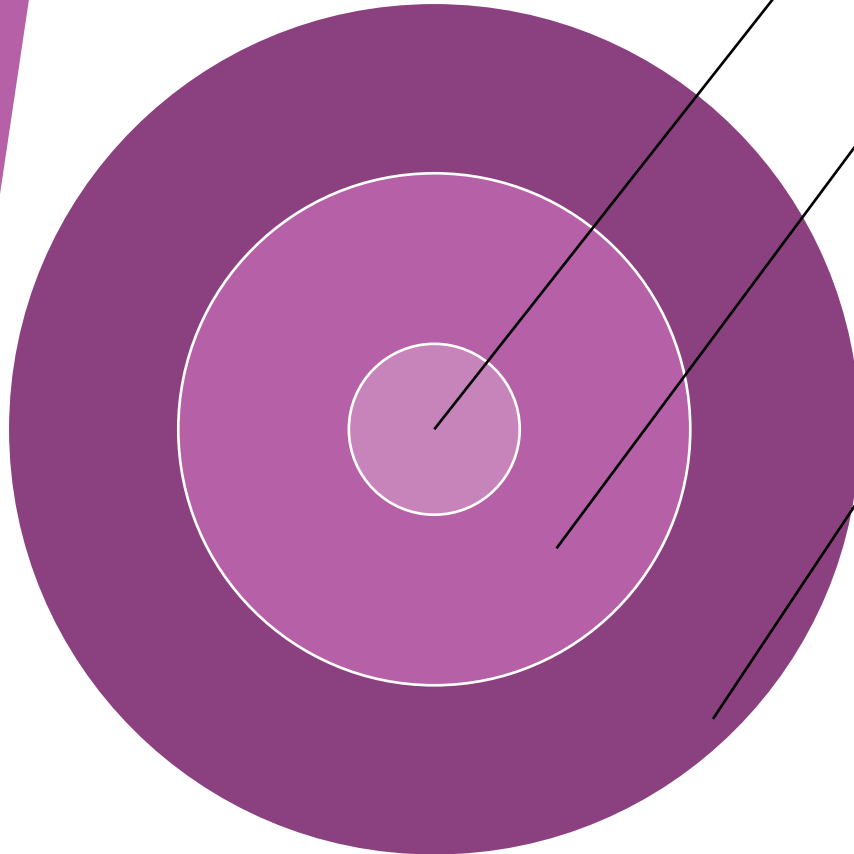


Move to evidence based proactive not reactive maintenance



Barriers to Deployment

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Culture

- Systematic reluctance to change
- Risk-averse
- 'Try before you buy' approach

Resources

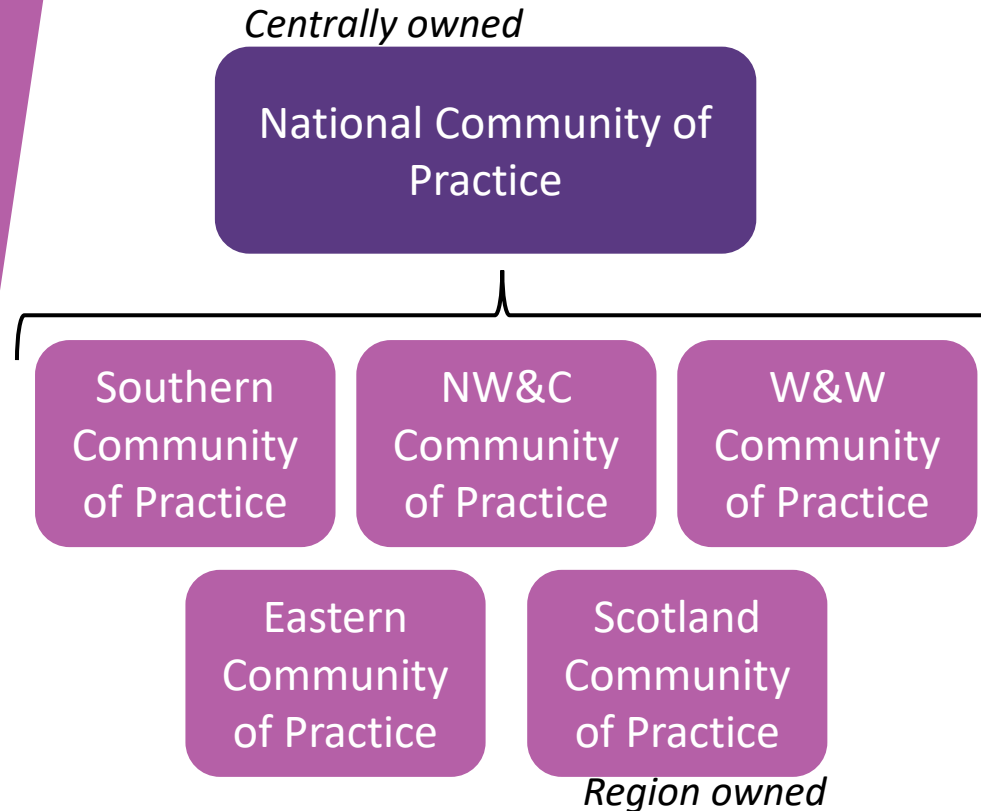
- Increasing pressures due to modernising maintenance
- Funding availability
- Manufacturing restraints

Inspections

- Classification of FELIX limiting use
- Competency to be configured
- Geographical difficulties

- Formed a National Community of Practice
- Invested in First-in-Class deployment support
- Invested in Business Change Support
- Hosting Demonstration Days
- R&D funding for x4 units
- 1:1s with the routes
- Commissioned a pre-deployment toolkit for the routes
- Enhanced communications strategy

Community of Practice



How will this benefit the routes?

- ❖ Gain knowledge from the collection of previous discussions and resources
- ❖ Learn from the routes where Felix is/ is being deployed
- ❖ Build an innovation network
- ❖ Opportunity to deploy technology that will drive resource optimisation, safety and efficiencies
- ❖ Contribute towards deployment
- ❖ Raise any risks/ issues
- ❖ Hear from guest speakers



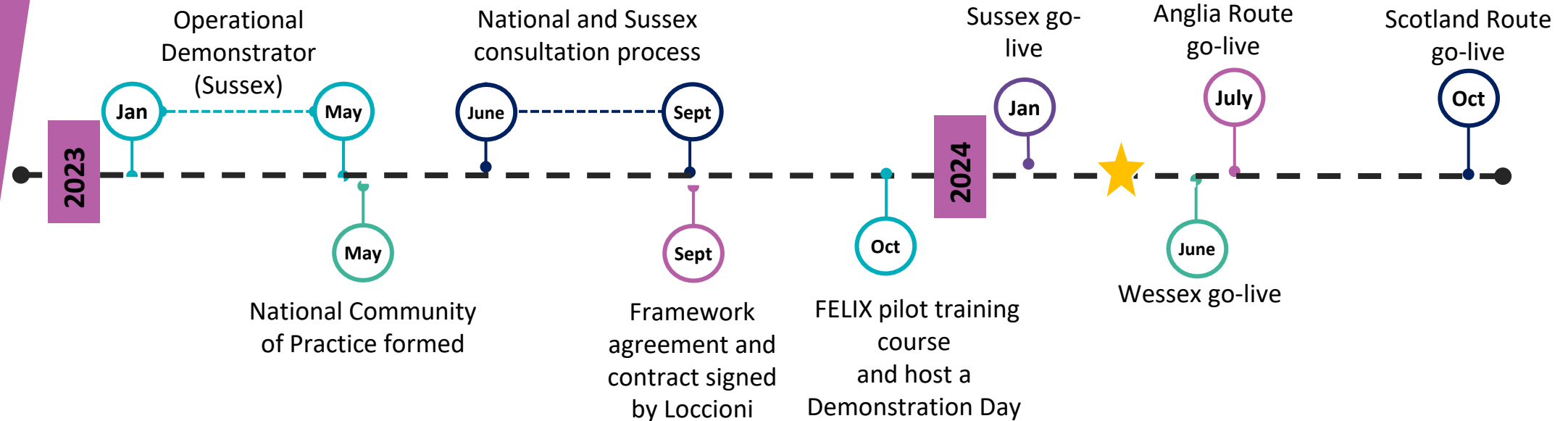
Contact:	
Danny Dymond, R&D Project Manager	Phil Windsor, Technical Lead
Tom Edge, R&D Programme Manager	
Jack Ramsay, R&D Systems Change Manager	

[Initial
configuration
tutorial](#) [User
Instruction
Manual](#) [Op. Dem
video](#)

regime	No change- planning will still be required for FELIX inspections
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Summary and Next Steps



Priorities:

- Conclude at Wessex Maintenance Council
- Conclude at Anglia Maintenance Council
- Host Wessex and Anglia training sessions (May and July)
- Train the trainers
- Conclude at Scotland Maintenance Council
- Host Scotland training session(s) (October)
- Continual improvement with the FELIX hardware and software

Demonstration Days

Please email

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FELIX

Thank you

