

MAY 2022

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# *Rail-Vision Signaling Scalable Remote Condition Monitoring Solution*

CHG UK

Peter Clarke – Technical Director

**AVEVA**

# About CHG



## UK, Sheffield based Company

- Established in 2004 as an electrical contractor and panel builder CHG expanded to provide software systems, integration solutions, products and services for various customers
- CHG focuses its efforts into Rail, Water & Waste Water, Utility Frameworks and Multisite Industrial Manufacturers, offering Engineering and Software Solutions using AVEVA OSI Soft and other software solution providers as well as our own bespoke developed software solution products
- Since 2008 CHG has expanded through growth & acquisition into a group of companies
  - CHG Main Group Company
  - Link2 Software Development & Integration
  - DSL Laboratory Automation Systems
  - Arentis Rail focused CCTV Image Transmission Systems and Solutions



Datech  
Scientific  
Limited



# Railway Signaling Data Visualisation & Reporting



## Challenge

- Provide data capture of Signaling and Device Data
- Visualisation & Reporting interlockings
- Translation of complex document input types
- Validated data Input/Output

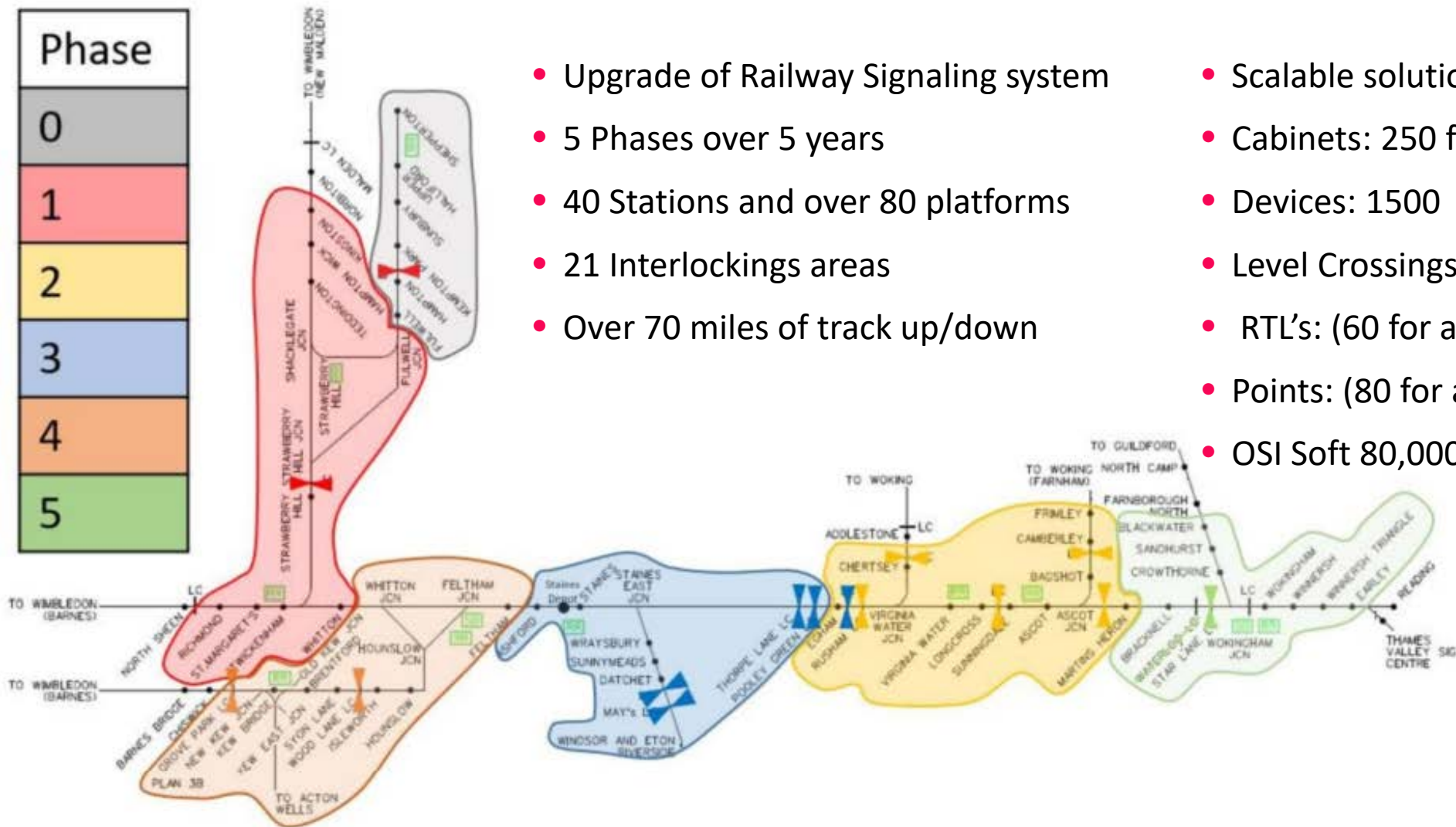
## Solution

- Deployed the latest AVEVA PI System technology including PI AF and PI Vision
- Design Automated File Generation and Validation Tool
- Automated Testing & Validation

## Benefits

- Increased granularity of information from disparate data sources
- Enhanced automated and real-time reporting
- Reduced maintenance requirements for fault diagnosis

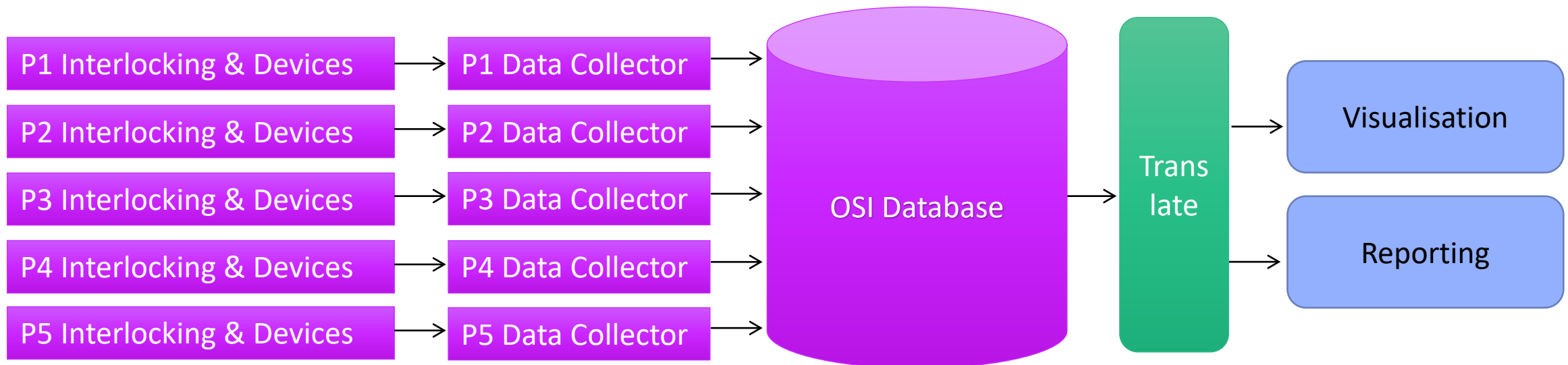
## Project Overview





## Development and Deployment Challenges

- System Deployment over 5 years
- Cannot adversely affect the running of the railway for previously deployed and operational areas
- Integration of system operation and functionality      Automated processing and validation of data configuration
- Ability to add innovation and enhancements as project progresses
- Modular architecture allows multiple data collectors to be added



## Auto Generation & Data Validation Tool

- The Auto Config Generator is a proprietary application developed within the Microsoft .Net environment.
- The Auto Config Generator transforms Excel based input files to a variety of output formats using pattern matching and regular expressions.
- Excel Input files are handled by the Microsoft Office Interoperability Layer and validated against known criteria such as Column information and Versioning Information.
- Data is then stored in Collections of Objects representing assets at specific locations.
- These Collections of Objects are then used to build configurations and tasks to build the system.
- Output formats include:
  - CSV Based Configuration Files
  - Command File / Powershell Scripts
  - JSON based Configuration Files
  - Microsoft Excel Documentation
  - Excel based Configuration Files
  - XML based Configuration Files
  - RESTful API Direct Configuration
  - RA FTView Databases (SQL)
- The majority of the outputs from the tool are static file-based configurations, but in two instances outputs are dynamic with scripts to determine the status of the network executed and direct dynamic configuration of Kepware Kepserver OPC Drivers via the product's own RESTful API.

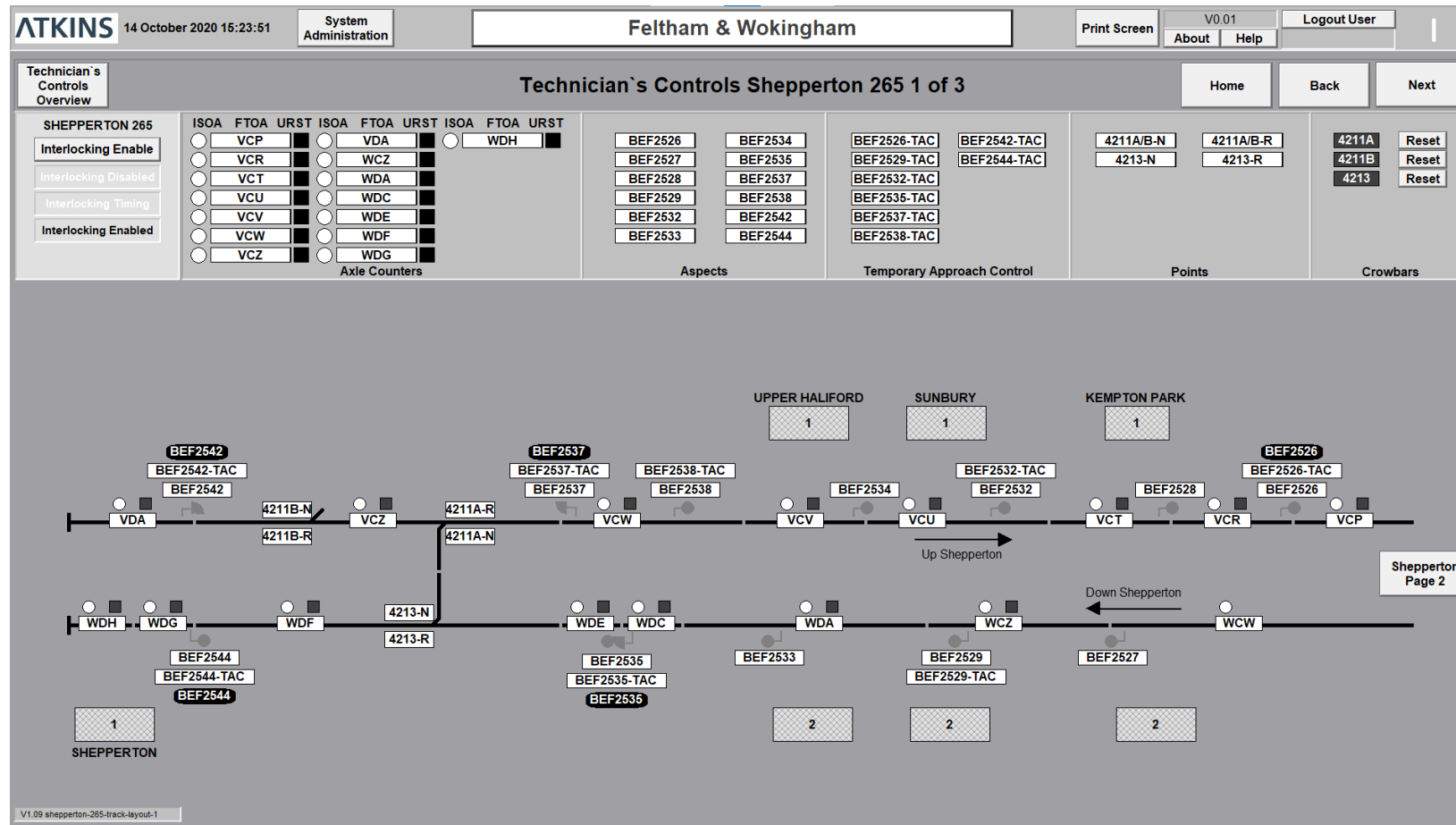
# Signaling Area Displays

The screenshot displays the ATKINS Signaling Area Displays interface. The top bar shows the date and time (10/05/2022 12:11:26), the title 'System Administration', and the location 'Feltham & Wokingham'. The main area is titled 'Main Overview' and contains a grid of interlocking areas. The grid is organized into four columns and six rows. The first three columns contain interlocking areas, and the fourth column contains control and monitoring functions. The interlocking areas are: Basingstoke ROC, Shepperton 265 Interlocking, Richmond 266 Interlocking, Twickenham 267 Interlocking, Strawberry Hill 268 Interlocking, Kingston 269 Interlocking, Kew Bridge 278 Interlocking, Hounslow 280 Interlocking, Whitton 281 Interlocking, Feltham 282 Interlocking, Ashford 283 Interlocking, Staines 284 Interlocking, Windsor 285 Interlocking, Virginia Water 287 Interlocking, Chertsey 288 Interlocking, and Sunningdale 289 Interlocking. The control and monitoring functions are: Technician's Controls Overview, Frauscher FDS Overview, Export Reports Overview, PI Vision, User Accounts Administration, and Shelve/Unshelve Points Alarms. The bottom section shows a detailed alarm log with columns for In Alarm Time, Alarm State, and Message. The log contains several entries for 'In Alarm, Unacked' status, indicating various communication link failures and interlocking system gateway port failures.

In Alarm Time	Alarm State	Message
04/05/2022 13:51:08	In Alarm, Unacked	[BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 1 - Communications Link Failure
04/05/2022 13:51:08	In Alarm, Unacked	[BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 2 - Communications Link Failure
04/05/2022 13:51:08	In Alarm, Unacked	[BASINGSTOKE ROC - TWICKNHAM(267) - INT4 - INT CUB 02] - Concentrator 1/COM-4 (Master/Slave) - Communications Link Failure
04/05/2022 13:51:08	In Alarm, Unacked	[BASINGSTOKE ROC - INT4 - INT CUB 02] - CON MON - Communications Link Failure
04/05/2022 13:51:08	In Alarm, Unacked	[BASINGSTOKE ROC - SHEPPERTON(265) - INT2 - INT CUB 01] - Concentrator 1/COM-2 (Master/Slave) - Communications Link Failure
04/05/2022 13:51:08	In Alarm, Unacked	[BASINGSTOKE ROC - INT2 - INT CUB 01] - Interlocking System Gateway Port 2 - Communications Link Failure
04/05/2022 13:51:08	In Alarm, Unacked	[BASINGSTOKE ROC - INT4 - INT CUB 02] - FDS 2 - Communications Link Failure

- Interlocking areas are shown in a standardized format for ease of navigation
- Cubicle and devices level displays indicate where issues are with Red Borders
- Detailed alarm and events displays show asset-based detail
- Tabular format to meet human factors requirements

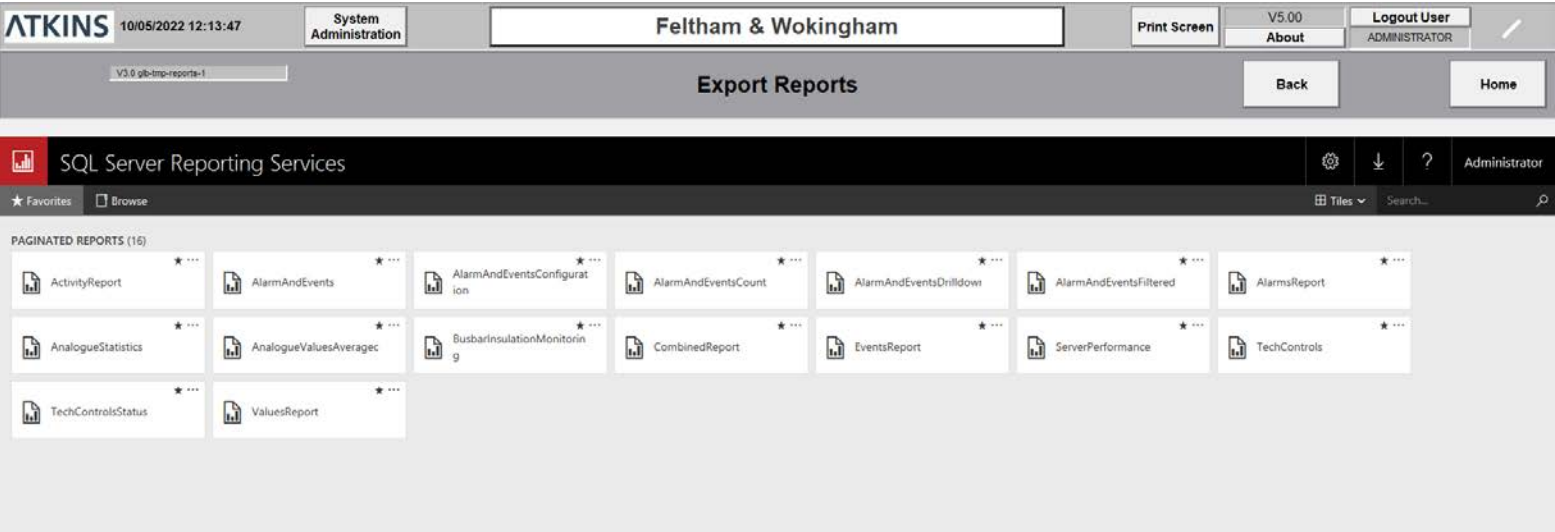
# Technician's Controls



- Scheme plan based layout for Control Centre Technician maintenance activities
- Indication of available and applied Technician's Controls



Reporting from the PI OLDB Interface using SSRS



- Reporting of system operation from OSISoft stored data
- Predefined reporting for incident investigation
- System performance monitoring
- Equipment operation and analytics

Analogue Statistics

Start Time : 01/04/2022 00:00:00 End Time : 01/05/2022 00:00:00 Source Filter : Description Filter :

Description	Minimum	Maximum	Mean	Source
[BASINGSTOKE ROC - ASCOT(290) - SIG2 - RDG1-028/1312A] - Network Switch - CPU Total 5 Minute Average	0	0	0	ACT RDG1 028
[BASINGSTOKE ROC - ASCOT(290) - SIG2 - RDG1-028/1312A] - Network Switch - Internal Temperature	0	0	0	ACT RDG1 028

Home > AlarmAndEvents

Start Time 01/04/2022 End Time 01/05/2022 Source

11/04/2022 12:10:16 [BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 2 - Internal Temperature Low Low

11/04/2022 12:10:16 [BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 2 - Internal Temperature Low

11/04/2022 12:10:16 Alarm enabled

11/04/2022 12:10:16 Alarm enabled

11/04/2022 12:10:16 Alarm enabled

11/04/2022 12:10:16 [BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 2 - Network Switch Ports Status Failed

11/04/2022 12:10:16 [BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 1 - Internal Temperature Low Low

11/04/2022 12:10:16 [BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 1 - Internal Temperature Low

11/04/2022 12:10:16 Alarm enabled

11/04/2022 12:10:16 Alarm enabled

11/04/2022 12:10:16 Alarm enabled

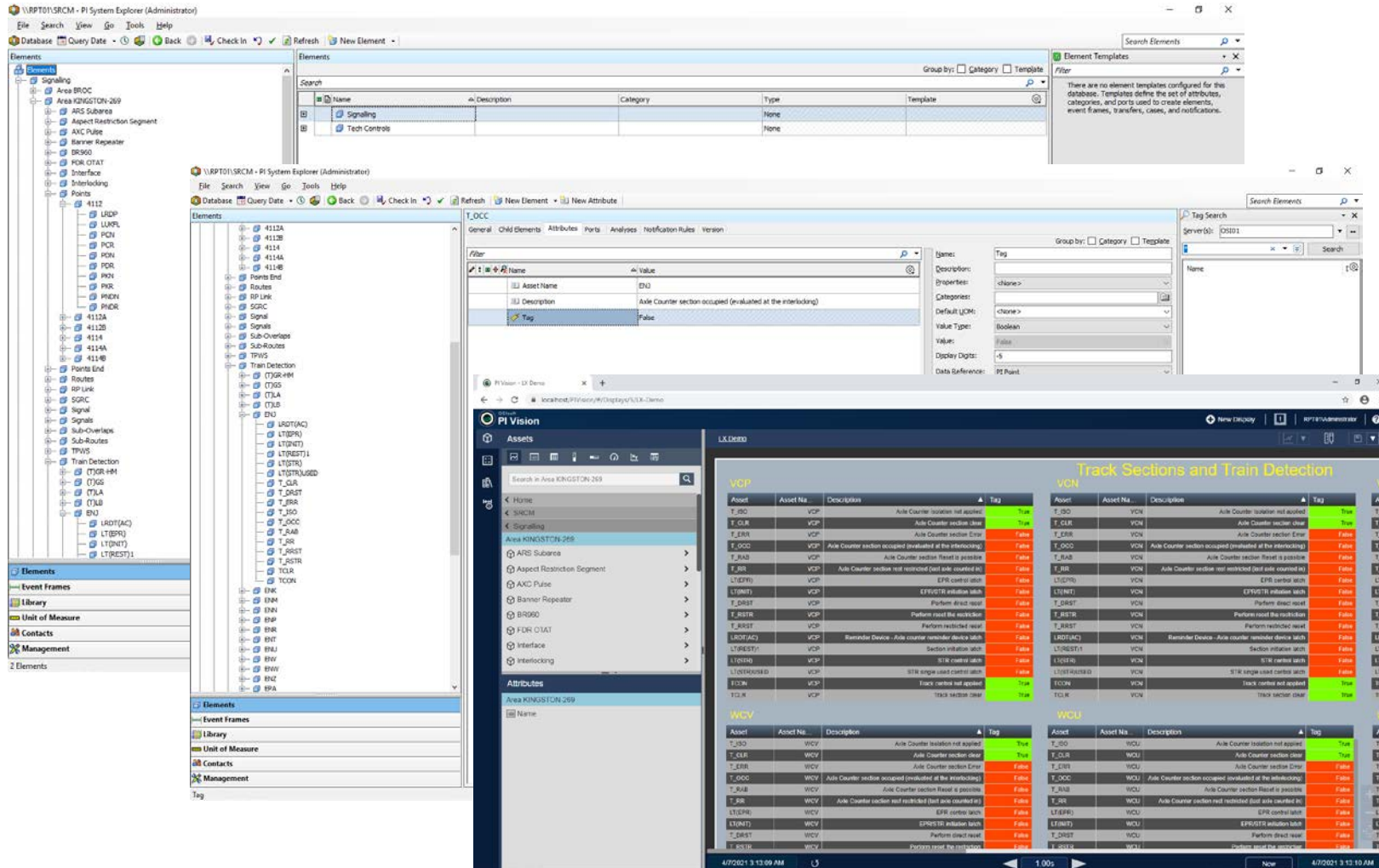
11/04/2022 12:10:16 [BASINGSTOKE ROC - INT4 - INT CUB 02] - Network Switch 1 - Network Switch Ports Status Failed

11/04/2022 12:10:16 Alarm enabled

11/04/2022 12:10:16 Alarm enabled

Item	Description	Set
BAS INT CUB 01 ELIX SHP BEF2512BR BRG	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - BEF2512BR_BRG Banner (Green) Link Status Enabled	False
BAS INT CUB 01 ELIX SHP BEF2519BR BRG	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - BEF2519BR_BRG Banner (Green) Link Status Enabled	False
BAS INT CUB 01 ELIX SHP BEF2521BR BRG	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - BEF2521BR_BRG Banner (Green) Link Status Enabled	False
BAS INT CUB 01 ELIX SHP BEF2524BR BRG	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - BEF2524BR_BRG Banner (Green) Link Status Enabled	False
BAS INT CUB 01 ELIX SHP SBEP2510 AND	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2510_AND Signal Memory - Aspect Not Disabled	True
BAS INT CUB 01 ELIX SHP SBEP2510 TACN	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2510_TACN Signal Memory - Temporary Approach Control Not Applied	True
BAS INT CUB 01 ELIX SHP SBEP2512 AND	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2512_AND Signal Memory - Aspect Not Disabled	True
BAS INT CUB 01 ELIX SHP SBEP2512 TACN	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2512_TACN Signal Memory - Temporary Approach Control Not Applied	True
BAS INT CUB 01 ELIX SHP SBEP2512BR AND	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2512BR_AND Signal Memory(Distant/Banner) - Aspect Not Disabled	True
BAS INT CUB 01 ELIX SHP SBEP2513 AND	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2513_AND Signal Memory - Aspect Not Disabled	True
BAS INT CUB 01 ELIX SHP SBEP2513 TACN	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2513_TACN Signal Memory - Temporary Approach Control Not Applied	True
BAS INT CUB 01 ELIX SHP SBEP2515 AND	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2515_AND Signal Memory - Aspect Not Disabled	True
BAS INT CUB 01 ELIX SHP SBEP2515 TACN	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2515_TACN Signal Memory - Temporary Approach Control Not Applied	True
BAS INT CUB 01 ELIX SHP SBEP2516 AND	[BASINGSTOKE ROC - SHEPRTON(265) - INT2 - INT CUB 01] - Genisys 2 - SBEP2516_AND Signal Memory - Aspect Not Disabled	True

Pi Vision & Asset Framework  
Level Crossings  
Points Monitoring  
Incident Investigation

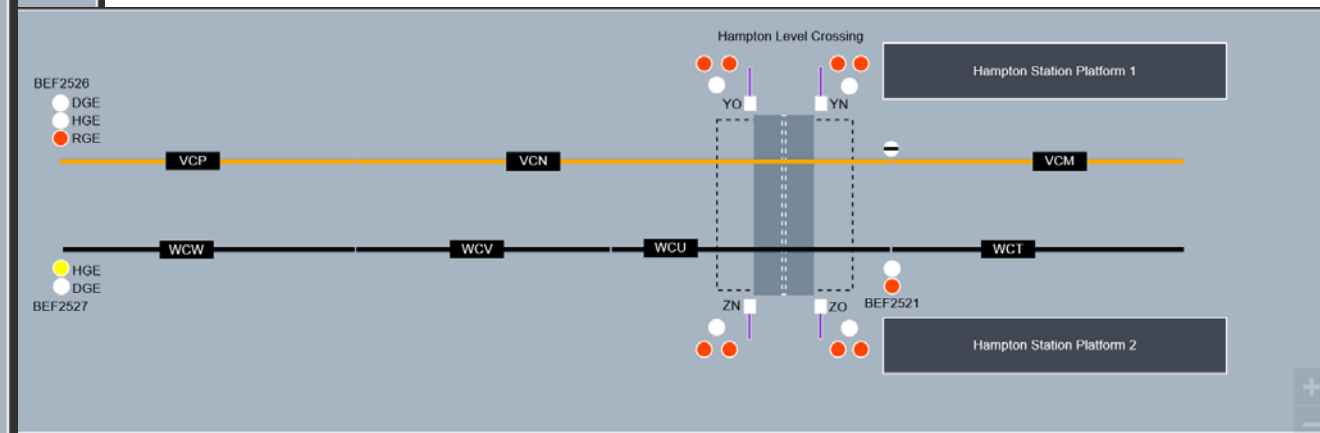


- Over 125 different assets defined
- Specified by available signaling information from the client
- AF Generated and imported using the Auto Config Generator.

# PI Vision - Level Crossing

Lamps				Hampton Level Crossing				Barrier Machines			
Asset	Asset Name	Description	Tag	Asset	Asset Name	Description	Tag	Asset	Asset Name	Description	Tag
S8_OP7_SFLOODLIGHTS	Road Traffic Light	CCTV Flood lights	False	Control/System States	Barrier Machine	Nearside Lower Acknowledgement Failure	False	S1_IP1RE	Barrier Machine	YNZN Barriers detected between 42°-90°	True
S8_OP8_SX	Road Traffic Light	Y/Z audible warning devices	True	Internal	Barrier Machine	Nearside Raise Drive Time Out Failure	False	S1_IP2RE	Barrier Machine	YOZO Barriers detected between 42°-90°	True
S7_OP2_FLRE(L)	Road Traffic Light	YN or ZN left red road light illuminated flashing	True	S1_IP3DN	Barrier Machine	Y/Z Barriers detected between 0°-4°	False	S1_IP4DNS	Barrier Machine	YNZN Down detection and safe torque off	False
S7_OP2_FLRE(R)	Road Traffic Light	YN or ZN right red road light illuminated flashing	True	S1_IP5PU	Barrier Machine	YNZN Barriers detected between 85°-90°	False	S1_IP6DNS	Barrier Machine	YOZO Down detection and safe torque off	False
S7_OP1_SHE	Road Traffic Light	YN or ZN yellow road light illuminated	False	S1_IP7UP	Barrier Machine	YOZO Barriers detected between 85°-90°	True	S1_OP1D1	Barrier Machine	YNZN barriers drive	False
S7_OP1_LPHE_LP	Road Traffic Light	YN or ZN yellow road light lamp proving	True	S1_OP2D2	Barrier Machine	YNZN barriers drive	True	S1_OP4D1	Barrier Machine	YOZO barriers drive	True
S8_OP2_FLRE(L)	Road Traffic Light	YO or ZO left red road light illuminated flashing	True	S1_OP5D2	Barrier Machine	YOZO barriers drive	False	S2_IP7D1-R	Barrier Machine	(YNZN) D1 barrier drive diagnostic	False
S8_OP2_FLRE(R)	Road Traffic Light	YO or ZO right red road light illuminated flashing	True	S2_IP8D2-R	Barrier Machine	(YNZN) D2 barrier drive diagnostic	True	S3_IP3(DOOR) C	Barrier Machine	Y/Z barrier doors closed	True
S8_OP3_APRE(R)	Road Traffic Light	YO or ZO right red road light illuminated alternate flashing	True	S3_IP7D1-R	Barrier Machine	(YOZO) D1 barrier drive diagnostic	True	S3_IP8D2-R	Barrier Machine	(YOZO) D2 barrier drive diagnostic	False
S8_OP3_LPRE(R)_LP	Road Traffic Light	YO or ZO right red road light lamp proving	True	S3_OP1(DOOR)	Barrier Machine	Hand mode not selected at LCU	True				
S8_OP1_SHE	Road Traffic Light	YO or ZO yellow road light illuminated	False								
S8_OP1_LPHE_LP	Road Traffic Light	YO or ZO yellow road light lamp proving	True								
S8_OP4_LPHE_LP	Road Traffic Light	YO or ZO yellow road light lamp proving	True								
Correspondence	Road Traffic Light	ZN or YN left red road light driven flashing	False								
S7_OP6_APRE(R)	Road Traffic Light	ZN or YN right red road light illuminated alternate flashing	True								
S7_OP5_FLRE(L)	Road Traffic Light	ZN or YN left red road light illuminated flashing	True								
S7_OP5_FLRE(R)	Road Traffic Light	ZN or YN right red road light illuminated flashing	True								
S7_OP3_APRE(R)	Road Traffic Light	ZN or YN right red road light illuminated alternate flashing	True								
S7_OP3_LPRE(R)_LP	Road Traffic Light	ZN or YN right red road light lamp proving	True								
S7_OP6_LPRE(R)_LP	Road Traffic Light	ZN or YN right red road light lamp proving	True								
JO	Road Traffic Light	ZN or YN yellow road light driven steady	False								
S7_OP4_SHE	Road Traffic Light	ZN or YN yellow road light illuminated	False								
S7_OP4_LPHE_LP	Road Traffic Light	ZN or YN yellow road light lamp proving	True								
S8_OP5_FLRE(L)	Road Traffic Light	ZO or YO left red road light illuminated flashing	True								
S8_OP5_LPRE(L)_LP	Road Traffic Light	ZO or YO left red road light lamp proving	True								
S8_OP6_APRE(R)	Road Traffic Light	ZO or YO right red road light illuminated alternate flashing	True								
S8_OP6_LPRE(R)_LP	Road Traffic Light	ZO or YO right red road light lamp proving	True								
S8_OP4_SHE	Road Traffic Light	ZO or YO yellow road light illuminated	False								

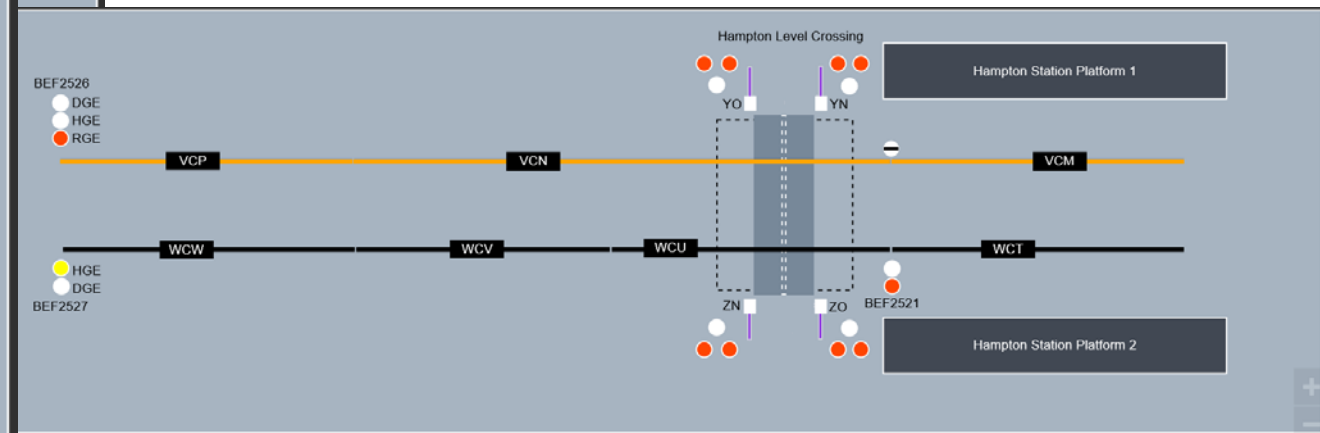
- Signaling interface operation
- Track section occupation
- Barrier Machine
- Road Traffic Lights
- Banner Repeater
- Time series operation



# PI Vision - Level Crossing

Lamps				Hampton Level Crossing				Barrier Machines			
Asset	Asset Name	Description	Tag	Asset	Asset Name	Description	Tag	Asset	Asset Name	Description	Tag
S8_OP7_SFLOODLIGHTS	Road Traffic Light	CCTV Flood lights	False	Control/System States	Barrier Machine	Nearside Lower Acknowledgement Failure	False	S1_IP1RE	Barrier Machine	YNZN Barriers detected between 42°-90°	True
S8_OP8_SX	Road Traffic Light	Y/Z audible warning devices	True	Internal	Barrier Machine	Nearside Raise Drive Time Out Failure	False	S1_IP2RE	Barrier Machine	YOZO Barriers detected between 42°-90°	True
S7_OP2_FLR(L)	Road Traffic Light	YN or ZN left red road light illuminated flashing	True	S1_IP3DN	Barrier Machine	Y/Z Barriers detected between 0°-4°	False	S1_IP4DNS	Barrier Machine	YNZN Down detection and safe torque off	False
S7_OP2_FLR(R)	Road Traffic Light	YN or ZN right red road light proving	True	S1_IP5PU	Barrier Machine	YNZN Barriers detected between 85°-90°	False	S1_IP6DNS	Barrier Machine	YOZO Down detection and safe torque off	False
S7_OP1_SHE	Road Traffic Light	YN or ZN yellow road light illuminated	False	S1_IP7UP	Barrier Machine	YOZO Barriers detected between 85°-90°	True	S1_OP1D1	Barrier Machine	YNZN barriers drive	False
S7_OP1_LPH_L	Road Traffic Light	YN or ZN yellow road light lamp proving	True	S1_OP2D2	Barrier Machine	YNZN barriers drive	True	S1_OP4D1	Barrier Machine	YOZO barriers drive	True
S8_OP2_FLR(L)	Road Traffic Light	YO or ZO left red road light illuminated flashing	True	S1_OP5D2	Barrier Machine	YOZO barriers drive	False	S2_IP7D1-R	Barrier Machine	(YNZN) D1 barrier drive diagnostic	False
S8_OP2_FLR(R)	Road Traffic Light	YO or ZO right red road light lamp proving	True	S2_IP8D2-R	Barrier Machine	(YNZN) D2 barrier drive diagnostic	True	S3_IP3(DOOR) C	Barrier Machine	Y/Z barrier doors closed	True
S8_OP3_AFR(R)	Road Traffic Light	YO or ZO right red road light illuminated alternate flashing	True	S3_IP7D1-R	Barrier Machine	(YOZO) D1 barrier drive diagnostic	True	S3_IP8D2-R	Barrier Machine	(YOZO) D2 barrier drive diagnostic	False
S8_OP3_LPH_L	Road Traffic Light	YO or ZO yellow road light lamp proving	True	S3_OP1(DOOR)	Barrier Machine	Hand mode not selected at LCU	True				
S8_OP1_SHE	Road Traffic Light	YO or ZO yellow road light illuminated	False								
S8_OP1_LPH_L	Road Traffic Light	YO or ZO yellow road light lamp proving	True								
S8_OP4_LPH_L	Road Traffic Light	YO or ZO yellow road light lamp proving	True								
Correspondence	Road Traffic Light	ZN or YN left red road light driven flashing	False								
S7_OP6_AFR(R)	Road Traffic Light	ZN or YN right red road light illuminated alternate flashing	True								
S7_OP5_FLR(L)	Road Traffic Light	ZN or YN left red road light illuminated flashing	True								
S7_OP5_FLR(R)	Road Traffic Light	ZN or YN right red road light lamp proving	True								
S7_OP3_AFR(R)	Road Traffic Light	ZN or YN right red road light illuminated alternate flashing	True								
S7_OP3_LPH_L	Road Traffic Light	ZN or YN right red road light lamp proving	True								
S7_OP6_LPH_L	Road Traffic Light	ZN or YN right red road light lamp proving	True								
JO	Road Traffic Light	ZN or YN yellow road light driven steady	False								
S7_OP4_SHE	Road Traffic Light	ZN or YN yellow road light illuminated	False								
S7_OP4_LPH_L	Road Traffic Light	ZN or YN yellow road light lamp proving	True								
S8_OP5_FLR(L)	Road Traffic Light	ZO or YO left red road light illuminated flashing	True								
S8_OP5_LPH_L	Road Traffic Light	ZO or YO yellow road light lamp proving	True								
S8_OP6_AFR(R)	Road Traffic Light	ZO or YO right red road light illuminated alternate flashing	True								
S8_OP6_LPH_L	Road Traffic Light	ZO or YO yellow road light lamp proving	True								
S8_OP4_SHE	Road Traffic Light	ZO or YO yellow road light illuminated	False								

- Signaling interface operation
- Track section occupation
- Barrier Machine
- Road Traffic Lights
- Banner Repeater
- Time series operation





## 515011

**AVEVA**

## PI Vision - Points

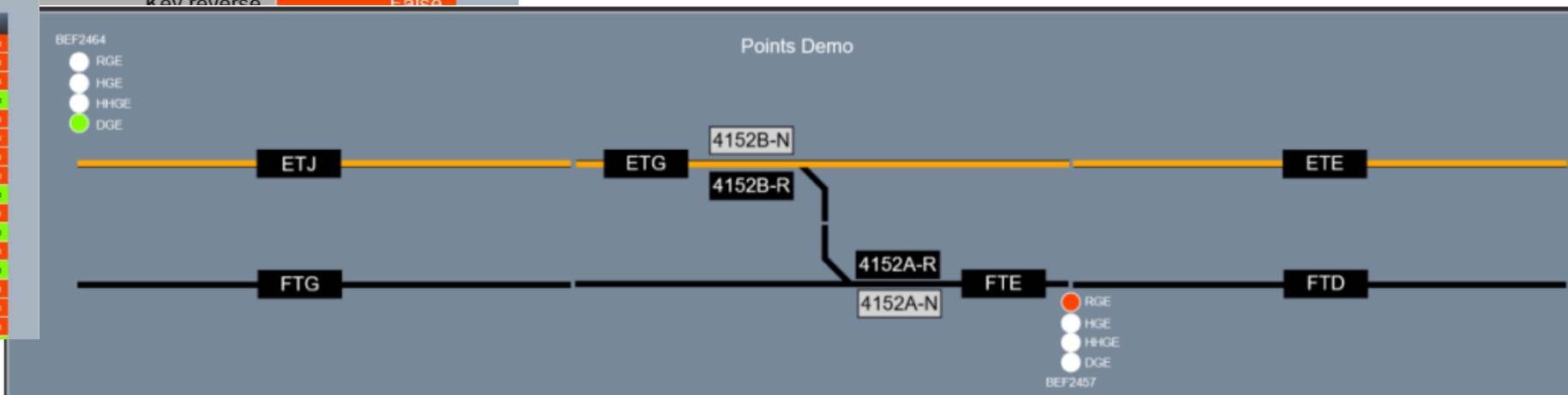
### Points Set 4152

Asset	Asset Name	Description ▲	Tag
PDN	4152	(Controlled and) detected normal	True
PDR	4152	(Controlled and) detected reverse	False
LUKFL	4152	Auto normalisation flashing indication	False
PCN	4152	Controls normal	True
PCR	4152	Controls reverse	False
		Key normal	False
		Key reverse	False

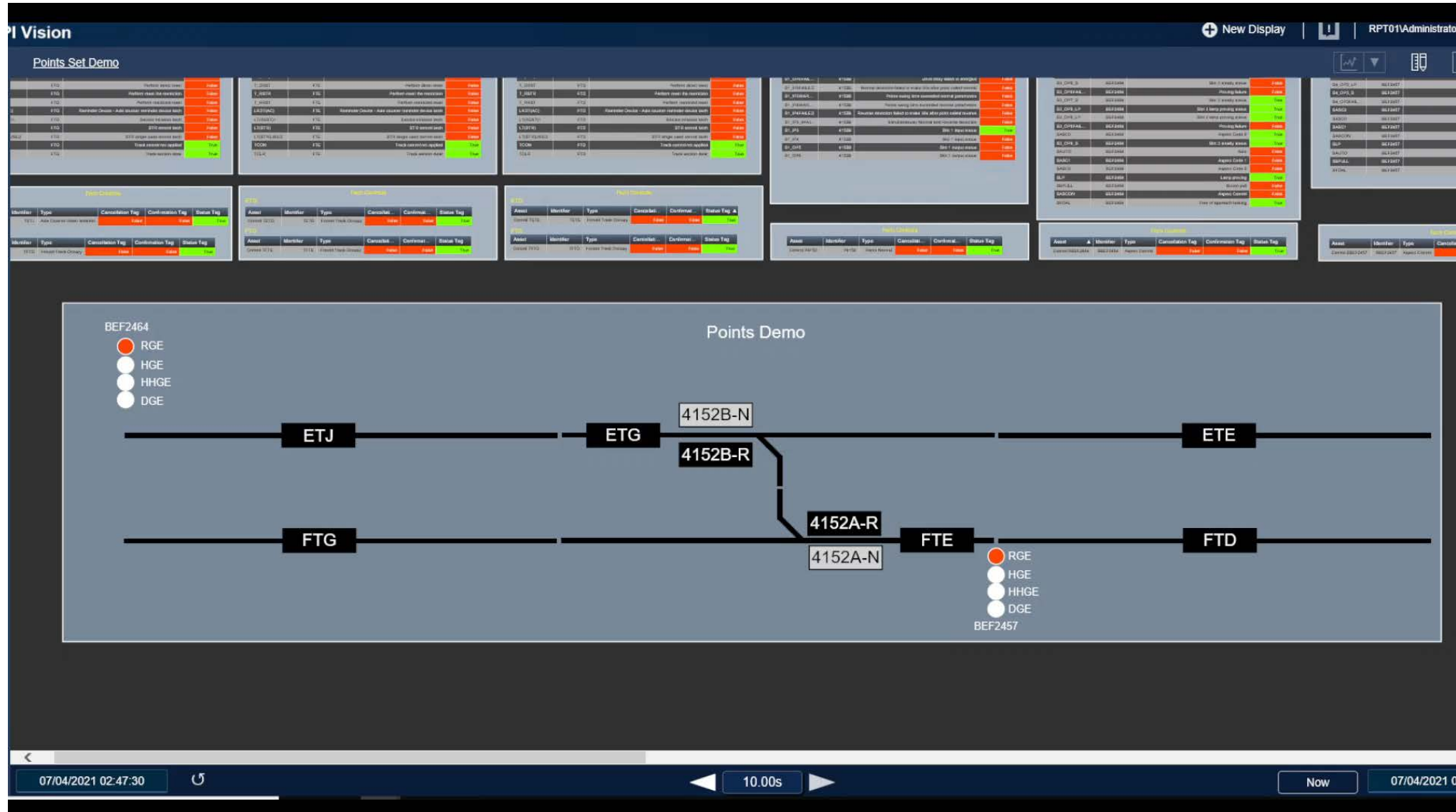
### Aspect BEF2464

Asset	Asset Name	Description	Tag
LRDE	BEF2464	Reminder Device Latches - ELECTRIC- Entrance Signals	False
LRD	BEF2464	Reminder Device Latches - ALL TRAFFIC - Entrance Signals	False
LRDA	BEF2464	Reminder Device Latches - Auto Working	False
S_AND	BEF2464	Signal Memory - Aspect not disabled	True
S_RIP	BEF2464	Signal Memory - Route/Junction indicator proved	False
LS(RRJ)	BEF2464	Restricted route status latch	False
LS(RRJ)	BEF2464	Restricted route indication latch	False
S_SSC	BEF2464	Signal Memory - Signal stick control set	False
S_NRR_V	BEF2464	Signal Memory - (Signal module) not red retained (vital)	True
S_TISP-00	BEF2464	Signal Memory - TISP bit 0	False
S_TACN	BEF2464	Signal Memory - Temporary approach control not applied	True
S2_OP0_S	BEF2464	Slot 2 steady status	False
S3_OP1_S	BEF2464	Slot 3 steady status	True
S2_OP5_S	BEF2464	Slot 2 steady status	False
S_TDRR	BEF2464	Signal Memory - TORR test passed	False
S_TISP-01	BEF2464	Signal Memory - TISP bit 1	False

- Signaling interface operation
- Track section occupation
- Points Swing Time, Aspects
- Application of Tech Controls
- Time series operation



## PI Vision – Points (Video)



# PI Vision – Incident Investigation

**Assets**

Search in Area KINGSTON-269

Area KINGSTON-269

ARS Subarea

Aspect Restriction Segment

AXC Pulse

Banner Repeater

BR960

FDR OTAT

Interface

Interlocking

**Attributes**

Area KINGSTON-269

Name

**VCP**

Asset	Asset Na...	Description	Tag
T_ISO	VCP	Axle Counter isolation not applied	True
T_CLR	VCP	Axle Counter section clear	True
T_ERR	VCP	Axle Counter section Error	False
T_OCC	VCP	Axle Counter section occupied (evaluated at the interlocking)	False
T_RAB	VCP	Axle Counter section Reset is possible	False
T_RR	VCP	Axle Counter section rest restricted (last axle counted in)	False
LT(EPR)	VCP	EPR control latch	False
LT(NT)	VCP	EPR/STR initiation latch	False
T_DRST	VCP	Perform direct reset	False
T_RSTR	VCP	Perform reset the restriction	False
T_RRST	VCP	Perform restricted reset	False
LRDT(AC)	VCP	Reminder Device - Axle counter reminder device latch	False
LT(KEST)1	VCP	Section initiation latch	False
LT(STR)	VCP	STR control latch	False
LT(STR)USED	VCP	STR single used control latch	False
TCON	VCP	Track control not applied	True
TCLR	VCP	Track section clear	True

**VCN**

**Track Sections and Train Detection**

Asset	Asset Na...	Description	Tag
T_ISO	VCN	Axle Counter isolation not applied	True
T_CLR	VCN	Axle Counter section clear	True
T_ERR	VCN	Axle Counter section Error	False
T_OCC	VCN	Axle Counter section occupied (evaluated at the interlocking)	False
T_RAB	VCN	Axle Counter section Reset is possible	False
T_RR	VCN	Axle Counter section rest restricted (last axle counted in)	False
LT(EPR)	VCN	EPR control latch	False
LT(NT)	VCN	EPR/STR initiation latch	False
T_DRST	VCN	Perform direct reset	False
T_RSTR	VCN	Perform reset the restriction	False
T_RRST	VCN	Perform restricted reset	False
LRDT(AC)	VCN	Reminder Device - Axle counter reminder device latch	False
LT(KEST)1	VCN	Section initiation latch	False
LT(STR)	VCN	STR control latch	False
LT(STR)USED	VCN	STR single used control latch	False
TCON	VCN	Track control not applied	True
TCLR	VCN	Track section clear	True

**WCV**

Asset	Asset Na...	Description	Tag
T_ISO	WCV	Axle Counter isolation not applied	True
T_CLR	WCV	Axle Counter section clear	True
T_ERR	WCV	Axle Counter section Error	False
T_OCC	WCV	Axle Counter section occupied (evaluated at the interlocking)	False
T_RAB	WCV	Axle Counter section Reset is possible	False
T_RR	WCV	Axle Counter section rest restricted (last axle counted in)	False
LT(EPR)	WCV	EPR control latch	False
LT(NT)	WCV	EPR/STR initiation latch	False
T_DRST	WCV	Perform direct reset	False
T_RSTR	WCV	Perform reset the restriction	False

**WCU**

Asset	Asset Na...	Description	Tag
T_ISO	WCU	Axle Counter isolation not applied	True
T_CLR	WCU	Axle Counter section clear	True
T_ERR	WCU	Axle Counter section Error	False
T_OCC	WCU	Axle Counter section occupied (evaluated at the interlocking)	False
T_RAB	WCU	Axle Counter section Reset is possible	False
T_RR	WCU	Axle Counter section rest restricted (last axle counted in)	False
LT(EPR)	WCU	EPR control latch	False
LT(NT)	WCU	EPR/STR initiation latch	False
T_DRST	WCU	Perform direct reset	False
T_RSTR	WCU	Perform reset the restriction	False

4/7/2021 3:13:09 AM

100s

Now

4/7/2021 3:13:10 AM

- Drag and Drop asset data and specific signals onto one screen
- Control Centre Technician configurable
- Re play data to identify issues and coloration between data sets
- Time series operation
- Track section occupation
- SPAD detection



# Railway Signaling Data Visualisation & Reporting



## Challenge

- Provide data capture of Signaling and Device Data
- Visualisation & Reporting interlockings
- Translation of complex document input types
- Validated data Input/Output

## Solution

- Deployed the latest AVEVA PI System technology including PI AF and PI Vision
- Design Automated File Generation and Validation Tool
- Automated Testing & Validation

## Benefits

- Improved visibility of data
- Reduced response time
- Making quicker informed decisions
- Automated compliance reporting
- Improved planned maintenance
- Get trains running quicker





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**ATKINS**

Member of the SNC-Lavalin Group

# Questions?

Please wait for the microphone

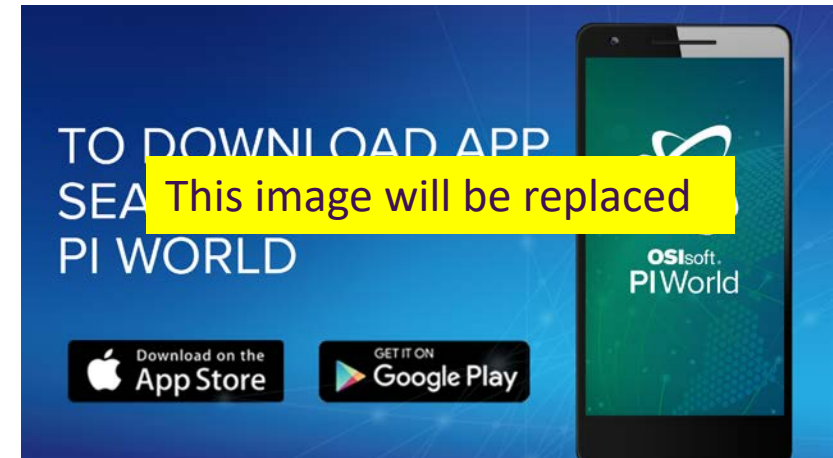
- State your name and company



## Please remember to...

Complete the survey!

- Navigate to this session in the mobile agenda for the survey



A word cloud featuring the phrase "THANK YOU" in the center, surrounded by numerous translations in various languages. The words are arranged in a circular pattern, with some appearing in larger fonts than others. The languages include English, Spanish, French, German, Italian, Japanese, Korean, Chinese, Hindi, and many others. The background is white, and the text is in a dark blue color.


THANK YOU


GRACIAS, MERCI, DANKE, GRAZIE, SHUKRA, 謝謝, ДАКЛАДЖИ, СПАСИБО, TERIMA KASIH, DANKU, GRAZIE, DANKON, TANK, TAPADH LEAT, SALAMAT, KEA LEBOHA, MISAOTRA ANAO, BAJARLALAA, DZIĘKUJĘ CI, NGIYABONGA, TEŞEKKÜR EDERİM, GRACIES, KÖSZÖNÖM, GO RAIBH MAITH AGAT, БЛАГОДАРЯ, МАHA DSANID, ПAKMET CИЗГЕ, 고맙습니다, GRAZIE, شكرًا, HVALA, FAAFETAI, ESKERRIK ASKO, HVALA, TEŞEKKÜR EDERİM, OBRIGADO, MERCİ, DI OU MÈSI, ĎAKUJEM, TERIMA KASIH, SIPAS JI WERE, UA TSAUG RAU KOJ, ТИ БЛАГОДАРАМ, СИПОС, WAZVIITA, FALEMINDERIT, PAKKA PÉR, PAXMAT CAҒA, HATUR NUHUN, RAHMAT, TAK, DANKE, DANK JE, EΥΧΑΡΙΣΤΩ, GRATIAS TIBI, MAHALO IĀ 'OE, TAKK SKAL DU HA, AČIŮ, SALAMAT, GRAZZI, CẢM ƠN BẠN, WAZVIITA

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