Modular Signalling –
A Flexible approach for a modern railway network

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Presentation Structure

- What are the drivers for change?
- Modular Signalling lifecycle and requirements management
- What do we mean by Modular Signalling?
- What has to happen to make this work?
- Conclusion
What are the drivers for change?

- Cost of operation
- Cost of equipment
- Cost of projects
- Cost of ownership

Cost of Signalling
What are the drivers for change?

- Cost of Signalling
- Network comms
- ETCS
- Higher reliability
- Lower power usage

Changing technology
What are the drivers for change?

- Cost of Signalling
  - Willingness to change
  - Desire to reduce operating costs
  - Ability to adjust railway cheaply
- Changing technology
  - The ‘Green agenda’
  - Acceptance of technology
  - Refusal to accept poor reliability
- Changing attitudes

An example ...

- Flexible operation
- ‘Green’
- High levels of safety
- In-built condition monitoring!
- ETCS compatibility an issue
- Lost knowledge
- Condition information and statistics not available remotely
- Low maintenance costs
- Extended service life
- Expensive to operate
- Has to be operated locally
- Difficult to alter
- ETCS compatibility an issue
- Has to be operated locally
- Difficult to alter
System Engineering Process Lifecycle

Module: Modular Signalling System Engineering Process

- Initiation
- Planning
- Requirements Capture
- System Concept

- Design & Development
- Implementation
- Integrate & Test
- Operation & Maintain
- Wider Applications

- Pilot Scheme
- New Products and Process
- Architecture
What do we mean by Modular Signalling?

- All equipment to be able to be transported safely without re-testing
- Design for object control will be cost optimised for common deployment scenarios
- Fixed number of standard parts to deliver projects reducing design optioneering
- Automated testing is to be the default means of system validation.
- Equipment Selection shall consider all aspects of the project lifecycle including installation, testing and whole life costs
- Components and architecture designed for rapid installation and commissioning supporting a 24/7 railway
- Partnership of product and process to deliver the greatest efficiencies
Products

- Radio Block Centre
- Control Centre
- Interlocking
- Signalling Network
- Object Controller
- Interlocking
- Object Controller
- Object Controller
- Object Controller
Process Changes

3 Key changes to the sequence of events

Hangaring → Design → Install → Test → Commission

Pit Stop Possessions
Enabling technology

- Power
- Civil structures
- Remote Condition Monitoring
- Etc., etc.
What has to happen to make this work?

- Changed attitudes
  - Contractor side
  - Client side
- Standardisation and simplification of rules
  - Challenging standards – without reducing safety
- Cooperation and collaboration between all parties
  - Open architectures and interfaces – to allow multiple suppliers to work on projects
Summary & Conclusions

- Modular Signalling used a simple System Engineering lifecycle
- Modular Signalling is a reality
- Many other infrastructure providers are opting to use this technology
- This approach offers the potential to revolutionise the capacity and through life costs of secondary lines
- The detailed requirements capture activity will facilitate the controlled application of many of the products and processes to other signalling schemes, of any scale, complexity or location
- Technology and processes proven in other industries are the key to successful implementation