At R&H we understand the importance of signalling as it allows the safe movement of trains at maximum permissible speed and minimum headway. Signalling can also be defined as the methodology of controlling train movements.

Our Signalling Department strives to provide our clients with optimal signalling solutions that not only meet their operational and logistic requirements, but also comply with the country specific train operating philosophies, rules and specifications. Our specialized team will provide appropriate solutions covering a wide variety of technologies, depending on the technical and operational requirements, ranging from dark territory train control systems to the latest communication based train authorisation system solutions.

Our scope of Signalling Rail Infrastructure Services extends from concept studies through feasibility phases to implementation design, project management, close-out and training. These services include:

- Analysis of existing train control and operating systems
- Signalling asset condition assessments and reports
- Feasibility analyses and costing
- Operational incident investigations and route cause analyses
- Signalling failure investigations and analyses
- Procurement processes and tendering
- System and project specifications including Bill of Quantities
- Construction management
- Maintenance management
- Checking and approval of detail signalling drawings
- Testing and commissioning of signalling installations

These services are undertaken based on technologies for train control systems approved for use by Transnet and PRASA in South Africa, and also extend to other independent infrastructure owners locally and in the rest of Africa and beyond. These systems include but are not limited to:

**DARK TERRITORY SOLUTIONS**

- Radio Train Order (RTO)
- Track Warrant System (TWS)
COMMUNICATION BASED AUTHORISATION SYSTEMS

Full Signalling (3-Aspect and Multi-aspect)

• Interlockings
  – Geographic
  – Legacy electro-mechanical
  – Hybrid
  – Electronic
• Remote control systems
• Low voltage power supply and distribution for signalling installations
• Track Vacancy Detection Systems
  – Track circuits
  – Axle counter systems

Other Systems

• Yard Control Techniques
• Level crossing protection
• Train condition monitoring systems e.g.
  – In-motion weighbridge
  – Hot Box / Bearing Detector etc.

TELECOMMUNICATION INFRASTRUCTURE SERVICES

Telecommunication forms the backbone of any train control system and is therefore an integral part of signalling solutions. The services offered are similar to the ones mentioned for signalling but also include additional services covering:

• Technology solutions and suitable migration paths
• Network optimisation strategies
• High site condition assessment
• Telecommunication system evaluation

Solutions for the abovementioned items will be based on the latest telecommunication technologies including:

• Fibre optic and microwave based backhaul systems
• Digital and analogue voice and data radio network systems

• Radio based voice communication in shunting yards
• Voice and data communication systems in locomotives
• SCADA systems
• End-of-Train devices
• Satellite based voice and data communication systems
• GPS based tracking systems
• Telecommunication systems to support Train Condition Monitoring Systems
  – Long range digital radio links
  – GPRS links
  – WiMax links
  – Point-to-multi-point systems

All telecommunication is based on the long-term convergence of telecommunication technologies.

RECENT PROJECTS

Recent projects where we have provided the above services either as part of the holistic multidisciplinary design effort or as a stand-alone service include:

• Study for the improvement of train services at Pretoria station (2009-2010); PRASA
• Upgrade of various level crossing protection systems in the Durban area (2009 to 2012); PRASA
• Nacala Corridor FEL3 in association with Aurecon (2010); Vale Mozambique Limited
• Dorstfontein Coal loading siding (2009 to 2012); Total Coal SA
• Coega Rail Infrastructure: Zones (2011): Coega Development Corporation (CDC)
• DFS study (2012): Phalabora Mining Company
• Limpopo Supply Chain Development FEL1 Study (2011 to 2012); Transnet Group Planning
• Unit Cost Model Development (2012); Transnet Group Planning
• Freight and Passenger System Interoperability Study (2012 to 2013); Transnet Group Planning and PRASA
• Investigation to implement a safe train control system at Hotazel (2012-2013): BHP Billiton
• Ore Line 82.5Mtpa FEL2 Study in association with Aurecon (2012 to 2013); Transnet Capital Projects
• Glosam private siding (2011 - 2013); PMG Mining
• Tweefontein coal loading siding (2013 - 2015); Xstrata Coal SA
• Durban Metro Resignalling Project (2013 - 2018); PRASA
• Mayoko Iron Ore Export Project (2012 - 2014); Exxaro