Our Company
List of contents

About Hitachi Rail STS
Key Data
Hitachi Rail STS Around the World
Main References
Competencies Business Lines
System Integration Activities
  Mass transit
  High Speed lines
  Freight
  Portfolio

BUILD THE FUTURE FUELING THE PRESENT
All around the world, Hitachi Rail STS supports its clients to create and develop more reliable, safe, sustainable and integrated transport networks that ease urban mobility, solve the challenges of increasing populations in fast-growth cities, and keep materials and industry moving.

From passenger to freight rail transportation networks, from urban to intercity and cross-border High Speed lines, Hitachi Rail STS develops and deploys cutting-edge technologies to meet operators’ needs and optimize performance independently of traffic density and complexity.

Hitachi Rail STS is a leading rail industry having implemented groundbreaking technologies on major projects such as:

- ERTMS/ETCS solutions combined with High Speed Rail, Conventional lines or Heavy Haul technologies for safer and interoperable networks
- Satellite positioning technology for safer and more accurate rail traffic management
- Driverless solutions to improve operational efficiency and flexibility and reduce operation and maintenance costs
- CBTC signaling technology to increase performances and reduce headway through a real moving block
- Advanced Components portfolio, covering all aspects of signaling and systems solutions (such as Switch Machines, Signals, Level Crossings, Relays, etc.)

Complete Integrated Mobility Solutions

More than 270 Km of Unattended Metro contracts all over the world
Railway and Mass Transit

Hitachi Rail STS is a global leader in passenger rail systems, designing, building, operating and maintaining advanced signalling technologies as well as turnkey solutions. These systems can include any of the technological subsystems that make up a transport system, including signalling, power supply, telecommunications, rolling stock and other technologies. Hitachi Rail STS supports clients with every type of signalling solution, from track circuits to Communications Based Train Control (CBTC) and from High Speed Railways to Driverless and Conventional Metro Systems.

Freight

Hitachi Rail STS has a history in the design and production of a full range of signalling solutions and components and provides operation and maintenance services for Heavy Haul and Freight customers around the world. From the wayside, on-board and office products that comprise a Heavy Haul or Freight network, to complete turnkey systems, Hitachi Rail STS is a leader in freight rail solutions. Our advanced, modular and scalable planning and control systems have improved network safety, reliability and efficiency to new levels.
Key Data as of December 2017

REVENUES
Min€ 1,361.0

NEW ORDERS
Min€ 1,500.8

BACKLOG
Min€ 6,457.5

EBIT
Min€ 100.8

NET FINANCIAL POSITION
(positive net cash)
Min€ (357.5)

HEADCOUNT (N.)
4,228

Order Backlog as of December 2017

Revenue as of December 2017

Copenhagen Driverless Metro
(tot. 2017 headcount 4,228)

Europe, North Africa & Middle East:

Americas:
Pittsburgh, Batesburg, Honolulu, Kansas City, Los Angeles, Rockville, Toronto, Kingston, Lima, Fortaleza, Caracas

“Share the passion”
Business Lines
Hitachi Rail STS delivers a full range of advanced technologies for passengers and freight rail transportation

Freight
Hitachi Rail STS is a leader in the freight transportation market. In Australia, it provides innovative heavy-haul freight rail solutions for several of the country’s key iron ore mining operations.

Passenger Transportation
So far, Hitachi Rail STS has developed more than 250 km of driverless unattended metro lines, with more than 245 stations, 12 control and maintenance centers and 380 trains.

Unit Operation & Maintenance
Hitachi Rail STS aims at structuring its Operation and Maintenance approach in order to become a Full Service Provider.
Main References and Projects Worldwide

USA
- SEPTA PTC commuter line
- Long Island Rail Road commuter line, East side access Speorok to Montauk
- Metros: Los Angeles Metro (Green Line), Honolulu rapid transit, New York Metro
- WAMATA Silver Springs
- WAMATA Dukes Phase 2
- PAAC North Shore Connector
- NYCT Chambers Street

Venezuela
- Metro: Los Teques

Peru
- Metro: Lima lines 2 - 4

Brazil
- Metro: Sao Paulo CPTM ATP lines 7 - 12
- Sao Paulo CPTM ATO lines 7 - 9 - 12

“Ride the rail”

Turkey
- Gebze - Koşaköy line
- Metro: Ankara lines 1, 2, 3, 4

Botswana
- Integrated Safeworking System (maintenance) Botswana Railways

UK
- High Speed One - Cambrian line - Fennby-Gilberdyke line
- Metro: Glasgow subway

Germany
- Saarbrücken - Mannheim HSL
- Berlin-Rostock HSL

China
- Shijiazhuang-Taiyuan DPL (Shi-Tai)
- Zhengzhou-Xian DPL

South Korea
- Seoul-Busan HSL
- Osong-Gwangju (Honam) HSL
- Rotem on-board program
- Sudokwon HSL

Taiwan
- Metro: Taipei Circular Line

India
- TPWS Northern railway
- TPWS Southern railway
- Metros: Kolkata metro, Mumbai monorail, Navi Mumbai metro

Malaysia
- North double track

Australia
- Rio Tinto
- Roy Hill Iron Ore
- ARTC

U.A.E.
- Etihad rail stage one (Shah - Habshan - Ruwais line)

Italy

France
- High Speed network including: Tours-Bordeaux (SEE), Le Mans-Rennes (BPL), Paris-Strasbourg (East Europe)
- Metro: Paris L 3 & L 6
- Brussels metro L1 & L5

Germany
- Saarbrücken - Mannheim HSL
- Berlin-Rostock HSL

Sweden
- Boden-Haparanda line

Denmark
- Metros: Copenhagen M1, M2, new City-Ring, Aarhus LRT

Turkey
- Gebze - Köseköy line
- Metro: Ankara lines 1, 2, 3, 4

Algeria
- Oued Telat - Tiemcen line

Morocco
- Tangiers - Kenitra HSL

Mexico
- Metro: Mexico City

South Africa
- Metros: Joburg, Sandton, Chloorkop, Emperor, Centurion, Midrand, Alberton, Pretoria
- Metros: Cape Town, Durban, Port Elizabeth

U.A.E.
- Etihad rail stage one (Shah - Habshan - Ruwais line)

Venezuela
- Metro: Los Teques

Peru
- Metro: Lima lines 2 - 4

Brazil
- Metro: Sao Paulo CPTM ATP lines 7 - 12
- Sao Paulo CPTM ATO lines 7 - 9 - 12

“Ride the rail”
Competencies

As an expert in Railway, Mass Transit and Freight signalling and turnkey projects, Hitachi Rail STS manages all of the phases of the project, from the design to the manufacturing and installation, testing and commissioning and operations and maintenance, independently of network size and complexity.

Contractual Capabilities

Hitachi Rail STS’s “full system approach” optimizes strategies, resources and investments and rationalizes technology types to provide state-of-the-art, viable and integrated transportation solutions within a municipality, region or country.

We act as lead contractor (or consortium partner) and system integrator for major projects around the world, under the following contractual schemes:

• Contracting for Design & Build
• Project Financing
• Public Private Partnerships (PPP)
• Build, Operate and Transfer (BOT)
• Design, Build, Operate and Maintain (DBOM).

A complete portfolio of solutions where the driver runs the trains up to fully ATO systems, where only limited actions are required by the driver.
Innovation

Since over a century, Hitachi Rail STS commits to pioneering within the rail signalling technology.

From the new era of High Speed Rail in Europe to ERTMS principle introduced in Europe and Asia and modernization of urban rail transportation, Hitachi Rail STS’ innovation spirit and capabilities, support operators and clients on the way of development.

Hitachi Rail STS is collaborating to the main European research programs within UNIFE focussing on digitalization (Shift2Rail & In2Rail and Stars), as well as IRT Railenium, that will pave the new path of the railway industry.

Satellite based train localization

Further to a first successful application on freight transportation network in Asia Pacific, Hitachi Rail STS commits to the adaptation of this new satellite based technology to the European rail networks together with main local rail operators (SNCF, RFI).

Dynamic Headway and smart ticketing

The Dynamic Headway and smart ticketing are digitalization applications to increase operational efficiency and passengers’ comfort and security. Dynamic Headway through human flow recognition in stations or on platforms helps calculating and adapting line capacity and traffic.

Autonomous trains

Based on its undisputed experiences and successes with fully automatic driving modes in metros, Hitachi Rail STS is now collaborating with main industry actors (Operators, suppliers, notified bodies…) to design and develop the fully autonomous train application that may become a standard in the near future.

The Smart Ticketing concept developed by Hitachi Rail STS for urban rail applications includes passenger’s information about traffic, trains localization and timetables as well as interoperability with other transport modes and many other services. Easy to use with smartphones, the smart ticketing focuses on facilitating passenger’s daily door-to-door journey.
Interoperable signalling systems: ERTMS/ETCS (Railway)
Communication Based Train Control: CBTC (Metro)
Train control systems: ATC / ATP / ATO
Computer Based Interlocking (CBI)
Centralized Traffic Control (CTC)
Wayside equipment & components
Operation support systems
Integrated Security systems.

System Integration Activities

Hitachi Rail STS provides design, verification, manufacturing, installation, testing and commissioning, operation, maintenance and training of complete Automation and Safety related Control Systems and Equipment for Passengers and Freight rail transportation.

Hitachi Rail STS’s activities encompass:
- System integration
- Traffic Management
- Train Control and Signalling Systems
- Telecommunications
- SCADA
- Power Supply
- Electrification
- Platform Screen Doors
- Fare Collection
- Depot Equipment
- Track Work
- Operations and Maintenance
Turnkey Mass Transit Solutions

Mass Transit is focusing on urban mobility, with stressed headway (down to 75 s) and high volumes of passengers per hour per direction on relatively short routes.

Conventional Metro
- Genoa Metro (Italy)
- Naples Line 1 Metro (Italy)
- Naples Line 6 Metro (Italy)

Driverless Metro
- Copenhagen M1/M2 (Denmark)
- Brescia (Italy)
- Milan Line 5 (Italy)
- Rome Line C (Italy)
- Thessaloniki (Greece)
- Taipei Circular Line (Taiwan)
- Riyadh University PNU (Saudi Arabia)
- Copenhagen City Ring (Denmark)
- Honolulu (USA)
- Milan Line 4 (Italy)
- Riyadh Metro (Saudi Arabia)
- Lima Metro Lines 2, 4 (Peru)
- Glasgow Subway (Scotland)

Tramway
- Midland Line 1 LRT - Birmingham (UK)
- Metrolink Manchester (UK)
- Sassari LRT (Italy)
- Dublin Lines A, B, C (Ireland)
- Florence Lines 1, 2, 3 (Italy)
- Metro Campania Nord Est (Italy)
- Aarhus LRT (Denmark)
Main Line and High Speed Solutions

Pioneer for advanced technologies:

For Decades, Hitachi Rail STS has been a worldwide Pioneer in the railway industry:

- In France as early as 1981 with the Paris-Lyon line (the first High Speed line in Europe),
- In Spain with the first HSL using ERTMS technology (Madrid-Leida)
- In UK with the first HSL (High Speed One connecting Paris to London) and the first ERTMS line (Cambrian line)
- In Sweden with Haparandabanan (first ERTMS deployment in Sweden)
- In Morocco with the Tanger-Kenitra line (the first High Speed line and first application of the ERTMS technology in Africa)
- In Italy with the first ERTMS 2 applications on High Speed National network

Technologies for Main Lines and High Speed Rails

- **TVM**: signaling system developed by Hitachi Rail STS in the early 80’s tailored for the needs and specificities of the first High Speed Lines in France, China and South Korea.
- **ERTMS/ETCS L1 & L2**: standard signaling solutions combined with High Speed Rail, Conventional lines and Heavy Haul technologies for safer and interoperable networks.

Hitachi Rail STS is among the 8 UNIFE members who developed the ERTMS project in close cooperation with the European Union, railway stakeholders and the GSM-R industry.
Hitachi Rail STS is the global partner for heavy haul mining and freight railways. Its advanced, modular and scalable planning and control systems have improved the network safety, reliability and efficiency to higher levels.

Benefits of Hitachi Rail STS’s Heavy Haul and Freight System solution

The advanced signalling and telecommunications system developed by Hitachi Rail STS features satellite positioning, and sets a new benchmark for operational flexibility and upgradability for heavy haulage mining railways.

It’s also:
- Based on Hitachi Rail STS’s proven knowledge, products and experience
- Modular, scalable
- Enables cost-effective solutions that can be enhanced and expanded over time
- Allows option of simple migration to a fully automated system (including Driverless Automatic Train Operation)

Heavy Haul and Freight

Australian mining Railways Projects

Hitachi Rail STS has been developing and delivering signalling and transportation solutions for heavy haul mining railway operations in Western Australia for more than 25 years and is currently delivering a number of turnkey solutions in the Pilbara region in the state’s north west.

First automated Heavy Haul railway, Hitachi Rail STS’s automated train management technology is enabling the automation of a 1,500 km remote heavy haulage iron ore rail network.

Planning, Supervision & Traffic Control

From basic command/control functions to large - scale system:
- Centralized Traffic Control (CTC) for High Speed lines and conventional lines
- Management of main stations
- Centralized electrification control
- Automatic systems for switching stations
- Supervisory control and data acquisition (SCADA)
- Optimizing Traffic Planner (OTP)
- Operation Control Center (OCC) for metro transport.

Hitachi Rail STS Freight Main References in Australia
- Rio Tinto Iron Ore Framework Agreement – 1,500 km Signalling and Telecommunication: Radio-based Signaling with Automatic Driving – Wayside & On-board
- Fortescue Metal Group Signalling and Telecommunications – 250 km Signaling (Interlocking) and Telecommunications
- Hamersley Iron Lang Hancock Rail – 65 km Signaling (Interlocking, ATP), Telecommunications and Asset Protection
- Aurizon (formerly QR National) – Synergy Alliance to design and implement several Signalling projects (Interlocking) in Eastern Australia
- Pilbara Iron 7-Mile Yard – Design and implement Signalling systems (Interlocking)
- Australia Rail Track Corporation – AANCSA Alliance to design and implement several Signalling and Telecommunication projects (Interlocking, Train Control & Dispatching, TLC)
- Australia Rail Track Corporation / Lockheed Martin – 120 km Pilot Project: Design and Supply of Advanced Train Management System ATMS (Interlocking, Train Control, ATP, Satellite Localization) – Wayside & On-board
- Robe River Iron Western Creek to Cape Lambert & Mesa A Projects – Signalling (Interlocking, Train Control, ATP, Asset Protection) and Telecommunications – Wayside & On-board
- Brookfield (formerly WestNet Rail) Midwest Rail – Signalling Systems (Interlocking and Computer-Assisted Train Control) for several projects

Hitachi Rail STS Freight Main References North America
- Positive Train Control (PTC)
- VitalNet™ PTC Components and System already implemented:
  - Union Pacific
  - CSX Transportation
  - Burlington Northern Santa Fe Railways
- PTC Office T3R-Server:
  - SEPTA
  - Office Systems
- Over 80000 km of freight lines managed by Hitachi Rail STS Office Systems, among which:
  - Union Pacific (Optimizing Traffic Planner )
  - CSX Transportation (Dispatch and Automation System)
- Microlok II Interlocking & Signalling Components (LED Signals, Level Crossings, Relays, Track Circuits, Switch Machines)
- Over 10000 units sold to U.S.A. & Canada Freight Railroads, among which:
  - Union Pacific
  - CSX Transportation
  - Burlington Northern Santa Fe Railways
  - Canadian Pacific
  - Canadian National Railway
  - Alaska Railroad
  - Norfolk Southern
  - Kansas City Southern Lines
  - Quebec North Shore & Labrador Railway

Hitachi Rail STS’s Heavy Haul and Freight Networks

Heavy Haul and Freight

Australian mining Railways Projects

Hitachi Rail STS has been developing and delivering signalling and transportation solutions for heavy haul mining railway operations in Western Australia for more than 25 years and is currently delivering a number of turnkey solutions in the Pilbara region in the state’s north west.

First automated Heavy Haul railway, Hitachi Rail STS’s automated train management technology is enabling the automation of a 1,500 km remote heavy haulage iron ore rail network.
Hitachi Rail STS is using the latest satellite and telecom technologies to develop cost-efficient train control systems with greater flexibility, global adaptability and optimized life cycle costs.

**Satellite Localization System features:**
- ERTMS / ETCS compatibility
- GPS, Glonass, Galileo
- Augmentation network
- SIL-4 compliant

**Multi-Bearer Telecommunications features:**
- TETRA
- Cellular, 2G/3G/4G
- Satellite
- Intelligent routing

Hitachi Rail STS is currently deploying and testing satellite train control technology in Australia and in Europe, with a considerable reduction of wayside & telecom equipment along the railway lines.

**Wayside Train & Infrastructure Monitoring Systems**

Hitachi Rail STS offers a range of systems and devices to monitor the conditions of railway Infrastructure

Wayside Train & Infrastructure Monitoring Systems (WTIMS).

WTIMS monitors the conditions of rolling stock and infrastructure in real time.

Train Conformity Check System.

Hitachi Rail STS’s TCCS™ acquires and processes accurate data for trains to 3D, thermographic and high resolution cameras to detect rolling stock defects or fire on board.

Undercarriage Thermographic Analysis.

UTA reveals overheated components underneath the trains, increasing safety.

**Satellite & Telecoms for Train Control System**
**Main Systems and Equipment**

**Interlockings of Computerized systems designed to meet the different needs of our customers:**

Simple interlocking system for railway “Multi-station” for entire rows.

**Wayside platform**

Since the late Nineties, Hitachi Rail STS has implemented the requirements for the “open” platform on standard protocols, such as: lines TVM Lyon and Marseille, ERTMS lines Rome-Naples, Turin-Milan, Milan-Bologna, Zheng-Xi, Madrid-Lleida, Cambrian, PohBarly - Kolín, Haparanadanian, CBTC lines in Chengdu, Shenyang, Ankara and conventional line Turin- Padua.

Hitachi Rail STS has implemented the platform WSP (Wayside Standard Platform) that is able to manage a reduced number of basic components, a higher number of bodies square and train connections to integrate into one central place, security features, diagnostics and control of movement appropriate to represent the best response to the market demands increasingly sophisticated rail and metro.

**Computer Based Interlocking**

- For small stations / Interlocking
- For medium-sized / large stations / Interlocking
- For an entire line (“Multistations”)

**Other trackside equipment:**

- Automatic block systems
- Track circuits
- Eurobalises
- Hot box and hot wheel detectors
- Point machines/switch machines
- Vital relays
- Level crossings
- Data transmission equipment
- Power supply equipment
- Diagnostic System (TCCS).
Hitachi Rail STS aims at structuring its Operation and Maintenance approach in order to become a Full Service Provider. Hitachi Rail STS can operate transportation systems 24/7 and provide complete maintenance to ensure full service availability. Since 2002, Hitachi Rail STS has successfully operated and maintained the Copenhagen Driverless Unattended Metro. Moreover, has been already awarded the O&M contract for the Honolulu Driverless Unattended Metro and other projects all over the world.

Hitachi Rail STS provides maintenance services for numerous railway networks and metro lines around the world, including:

- Channel Tunnel Rail Link (UK)
- Madrid-Lerida High Speed Line (Spain)
- Union Pacific, CSX (USA)
- Northwest and Perth TCS (Australia)
- Mainline railway (Botswana)
- Metros (Paris, Lyon)
- La Robla - Pola de Lena (Spain)
- Glasgow Subway (Scotland)

Credits:
Publishers | Hitachi Rail STS
Photos | Peppe Avallone, Edoardo Montagna, Gitte Albertsen
Images used on cover, p4, p17 and p14
Copyright© 2010 Rio Tinto
Printed | 07/2016