

# Signalling systems



# Vossloh Cogifer, a world a major player in railway



## The Vossloh group's mission

To provide safe, proven, cost-effective and sustainable solutions in order to meet the growing mobility needs of people and goods.

## Vossloh Cogifer's goals

To carry out this mission, we aim to offer all of our customers—infrastructure managers, integrated rail companies, global contractors, railway concessions, railway companies—high-performance,

tailored points, crossings and signalling systems for all types of networks: high-speed, conventional and heavy-haul railways; rapid transit systems and tramways.

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# leader in points and crossings and signalling systems



## Our expertise and capabilities

We rely on our long history and industry experience to design innovative equipment that continually offers heightened performance and is adapted to the specific needs of our customers. At the same time, we provide the best safety guarantees for transported passengers and merchandise. Thanks to our efficient and

experienced teams and our network of 25 subsidiaries around the world, we have the local presence, flexibility and adaptability necessary to supply our customers with the tailored solutions they expect. Vossloh Cogifer offers global solutions comprising switch systems, related safety equipment, and products

for actuation, locking and monitoring. We also provide signalling systems with remote monitoring technology for predictive maintenance. At Vossloh Cogifer, we have the technical and human resources to support our customers at every step in their projects, from diagnosing needs to the delivery, on-site

installation and set-up of customised, specific solutions. Our research and development capacity and international presence enable us to offer the best, most innovative solutions based on our international experience, while guaranteeing a high level of reliability and optimised life cycle costs.

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# Signalling products: highly distinguish

Vossloh Cogifer offers a complete line of signalling products intended for all railway networks in many countries throughout the world: tramways, rapid transit systems, conventional railways, high-speed



## VCC clamp lock: a Vossloh Cogifer exclusive

The VCC is a locking and switch monitoring device. Its distinguishing feature: the VCC's operation is linked to that of the switch, as the clamp is attached to the stock rail. The slide chair, across which the switch slides, is also integrated. The total integration of the VCC makes it more secure, which is indispensable for high-speed lines as well as classic lines. The VCC is certified by RFF and SNCF Infrastructure (which requires use of this lock on all tracks in the French network whenever operating speed exceeds 40 km/h). It is also preferred in the high-speed markets of many other countries. The VCC's complete safety serves as a measure of guarantee for its use on passenger networks (rapid transit systems, RER, railway) and heavy-haul networks (Australian Rail Track Corporation, Eurotunnel, etc.).

# ed products focused on safety

railways and very high-speed railways. These products are the result of long-held expertise and rigorous design decisions. Some of our offers are one-of-a-kind on the market.



Mobile point lock, East European high-speed line, France

## Movable point lock (VPM): the VCC's 'little brother'

Designed with the same principle as the VCC clamp lock, the VPM locks the movable point frog, while monitoring its position and

lock status. Reserved for lines carrying high-speed trains (200 km/h and above), it offers an unparalleled level of safety.



Paulvé on the East European high-speed line, France

## Paulvé point detector

This device monitors the operation and opening of the locks and movable point frogs of points and crossings. Placed closer to the track and resistant to vibrations, the device is reliable in all

conditions. A true flagship product of the Vossloh Cogifer offer, the Paulvé point detector sells thousands of models each year, equipping more than 60 networks of all types throughout the world.

## What about the future?

Our R&D teams continuously work to improve existing product lines. Their primary axis of research is designing products that resist sharp fluctuations in temperature and the

effects of sand. The goal: respond to the constraints of certain particularly dynamic and demanding international markets.



## Switch mechanisms: the culmination of Vossloh Cogifer's expertise

Vossloh Cogifer's line of actuation mechanisms includes 14 different products tailored to every situation. Electrohydraulic or electromechanical, each product is adapted to a specific market segment, such as railways, rapid transit systems or tramways. They all have a reliable motor, developed using our long-term experience and recognised know-how. Vossloh Cogifer switch mechanisms have proven their quality in over 30 countries.



Easyswitch-R (open on the left, closed on the right), Lyon tramway line, Meyzieu station, France

## Integrated mechanism (Easyswitch-R): a feat of integration

Within a hollow sleeper, the integrated actuation system includes a motor, a VCC lock and a monitoring device, each of which have thoroughly proven their effectiveness.

Modular and easy to clean, this sleeper is designed to facilitate the optimal mechanical packing of points and crossings. The compact and reliable

product handles operation, monitoring and locking functions in a reduced area. This is an incomparable advantage when space is limited, such as in tunnels.

## Level crossing mechanisms

Vossloh Cogifer now offers a cost-effective, reliable electrohydraulic operating device that is mainly intended for export.

Studies are underway for an electromechanical mechanism that will meet the demands of all railway networks.



Traffic detector, Reichshoffen, France

## Traffic detector: an essential safety device

This device detects the passage of a train, with or without direction selection. It thus makes it possible to alert teams working on railways, announce the arrival of a train at a station, or control a level crossing. Recognised for its reliability, more than 2,000 models of this device are sold each year.

# Signalling systems: highlighting Vossloh

Vossloh Cogifer designs tailored signalling solutions for tramway and railway networks, both for passenger and heavy-haul transportation. Our capacity for integration enables us to undertake turnkey projects



MYA, United States

## A customised offer

Vossloh Cogifer offers several lines of signalling products and systems that correspond to a variety of markets.

- **Computer-controlled relay-interlocking stations:** these stations use safety relays to ensure interlocking, offering the flexibility of computer control for non-safety aspects.
- **Computerised interlocking systems:** all interlocking operations are performed by software and centralised in a computer with a Safety Integrity Level 4 (SIL4).
- **Control and monitoring systems (SNTI):** with an SIL2, these systems use computerised or traditional stations (TCO) to remotely control computerised or relay-interlocking stations.

Our offer also includes products designed and developed by Global Rail Systems (GRS), a subsidiary of Vossloh Cogifer:

- **By-pass stations for heavy-haul networks (FAS-PAS):** this patented technology employs simplified interlocking principles based on the use of radio-controlled and remote monitoring from within trains.
- **Marshalling yard management systems (MYA):** integrate automated control of switches, signals and routes through computerised equipment.
- **A variety of other signalling products,** such as audio railway circuits, coded railway circuits, time delay safety modules, and derailment detectors.



Tramway control station, Nice, France

# Cogifer's integration capacity

from start to finish: from design to commissioning, including studies, supply, manufacture, assembly, tests and training.



## A global solution

For each project, Vossloh Cogifer sets up an adapted team with all the necessary skills. This offers our customers a number of benefits:

- **a global solution** fully tailored to their needs, which enables projects to integrate connected telephony and remote maintenance systems;
- **competitive pricing**;
- **a high level of responsiveness** in the solution's design, which helps to reduce and control production time.

## A safety level that complies with the strictest requirements

For passenger transportation, Vossloh Cogifer designs signalling systems that comply with the SIL requirements set by the European Committee of Electrotechnical Standardisation (CENELEC), up to the highest level (4). Our methods and products are also certified.

## References

### Tunisia (SNCFT):

- Turnkey contract: PIPC computer stations (Thales) in the framework of the 'Sousse Triangle'
- Equipment provision for other stations on the Tunis-Sfax line, as well as stations on the Tunis-Algiers line
- Unified track management systems with centralised monitoring, specially adapted to the distinct nature of operations in southern Tunisia (Gafsa-El Aouinet line)

### Algeria (SNTF and ANESRIF):

- Turnkey contract: PIPC computer stations (Thales) linked to centralised control as well as safety telephony, on the BBA-M'Sila railway
- Additional contracts on the Annaba-Ramdane Djamel line
- Deployment of our signalling and safety telephony products in the framework of the Rcade Nord project

### France:

- RFF: a joint contract with our partner Thales (consortium leader), set-up of PIPC computerised stations
- Development and deployment of the SNTI system (SIL2)

### Corsican Railways:

Alister computerised posts (Funkwerk) remotely controlled from a Centralised Control Station

Signalling systems adapted to tramways:

- Grenoble networks (two lines)
- Lyon (line extension, Leslys)
- Montpellier (two lines)
- Paris (two lines)
- Saint-Étienne
- All equipment for the Le Mans networks
- Nantes (three lines)
- Strasbourg (five lines)
- Valenciennes

### Morocco (ONCF):

Two Rabat tramway lines that integrate Duo (doubled) Centralised Supervision Stations.

### Guinea (BOKE):

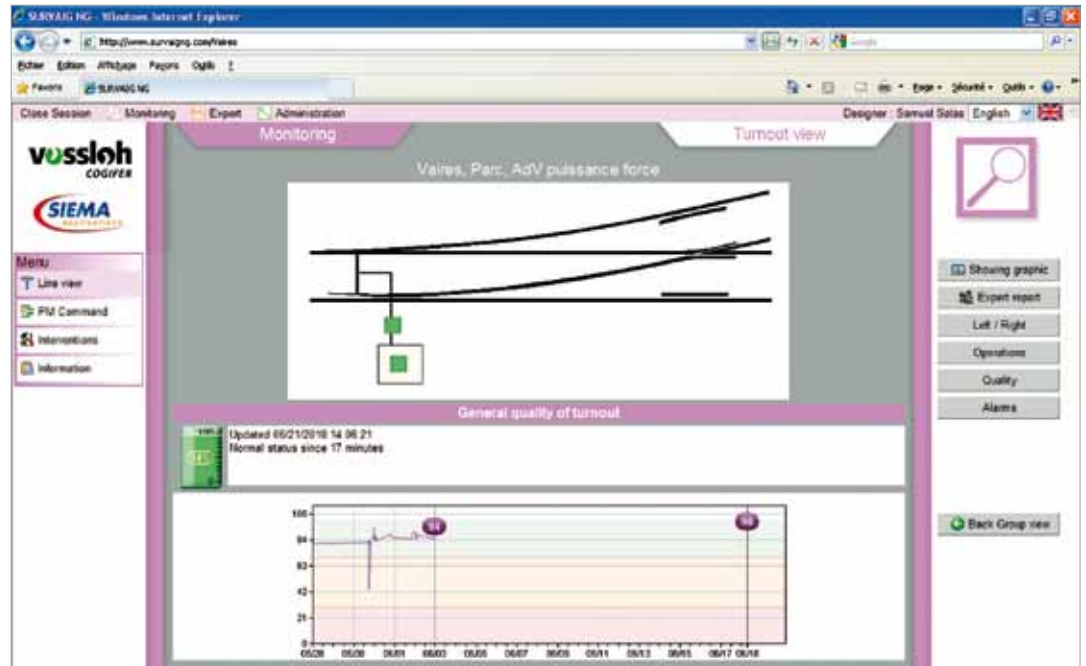
Centralised regulation system for the transport of heavy and infrequent hauls on mining lines.

### United States:

■ FAS-PAS and MYA products and systems, designed and developed by our subsidiary GRS on certain heavy-haul networks.

# Track monitoring and safety

Vossloh Cogifer and subsidiary SIEMA Applications offer customers a complete and innovative line of products for predictive and event-driven remote monitoring of railway equipment located on the track, in signalling stations or in train stations.



Entry screen for the SURVAIG NG application

## Event-driven remote monitoring: monitoring events from a distance

SIAM is a product in the PRIME line that is dedicated to event-based remote monitoring. Remotely supplying precise and reliable information on equipment status, SIAM is very useful for deciding upon and preparing on-site intervention. The result is optimised team responsiveness, reduction

of maintenance costs, and improvement of product life cycles. SIAM makes it possible to relay in real time all information gathered by sensors located along the track, as well as by those in technical and signalling facilities. Identified events (open- or closed-

level crossing mechanisms, for example) are continually analysed, and the slightest operation anomalies are displayed on a screen. A user-friendly human-machine interface enables the operator to analyse transmitted alerts and alarms and form a clear idea of the situation in the field

before organising maintenance. In addition to generating alerts and alarms in response to on-site events, SIAM makes it possible to centralise and organise alarms from other systems like SURVAIG or SURTRACK.

## A complete and modular offer

Vossloh Cogifer supports its customers from the first stages of their remote monitoring or predictive maintenance projects. We perform a needs diagnostic in order to offer tailored solutions. We can respond to any equipment monitoring issue on any type of railway.

# telephony

**PRIME:** an integrated offer for remotely monitoring railway equipment.



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SURVAIG, Perpignan-Figueras high-speed line, France

## Predictive maintenance: anticipating breakdowns

**SURVAIG NG** and **SURTRACK** products are respectively intended for the predictive maintenance of points and crossings and track circuits. They alert clients to potential breakdowns or deterioration through sensors that relay precise physical data (power of the switch motor, rail temperature,

vibration of points and crossings, etc.). An artificial intelligence system analyses this multivariable data, thus measuring equipment evolution. The result is displayed in a clear and concise way on a web page, for example, allowing the agent to intervene and prevent malfunctions.

## A cutting-edge offer

The group's offer integrates the latest digital communication technologies. In particular, the connection to the GSM-R network makes a wireless facility possible. The use of IP support helps

to reduce installation or modification costs. Our offer can also combine these new technologies into a single installation along with the existing analogue mode.

## References

### **SIAM**

*RFF and SNCF  
Infrastructure: high-speed lines, major and suburban lines (France)  
RATP (France)  
SNCF (Tunisia)*

### **SURVAIG NG**

*RFF and SNCF  
Infrastructure: high-speed lines, major and suburban lines (France)  
INFRABEL (Belgium)  
TP FERRO, concession of the Perpignan-Figueras LGV line (France)*

### **SURTRACK**

*RFF and SNCF  
Infrastructure: major and urban lines (France)*

We also offer a wide range of railway telephony products that integrate the best communication technologies, ensuring everyone's safety.

**NUMCOM:** a complete line of digital telephony products dedicated to railway safety.



SIEMA digital switch in Villeurbanne, France

## Digital switches

Using NUMCOM POE consoles, these switches enable the connection between voice telephone posts (PTE) and trains or stations, regardless of the network used: GSM-R, Ethernet, or analogue railway lines.

The group's newest solution, the NUMCOM-3000 uses voice over IP (VoIP) technology and

digital signal treatment, thus providing the advantages of this cutting-edge technology while remaining compatible with traditional technology. It is designed on a user-friendly business interface and modular architecture, and is therefore suited to small and large train stations.

## References

- Réseau Ferré de France (RFF)
- Société Nationale des Chemins de fer Français (SNCF) Infrastructure.
- Office National des Chemins de Fer Marocains (ONCF)
- Société Nationale des Transports Ferroviaires Algériens (SNTF)
- Agence Nationale d'Études et de Suivi de la Réalisation des Investissements Ferroviaires (ANESRIF)
- Société d'Exploitation du Trans Gabonnais (SETRAG)

## Digital operator consoles

NUMCOM POE is an operator post that makes it possible to connect to the various SIEMA Applications consoles, both old and new. Connected by Ethernet cable to the console, it optimises the use of wires and can be equipped with one to three handsets. The ergonomic interface can be configured for any type of use. It uses VoIP technology and is equipped with a flat, colour touchscreen as well as a customisable keyboard with touch-sensitive keys.



SIEMA work phone in Villeurbanne, France

## Work telephones (PTM)

These light telephones were designed for maintenance teams on the track. They let

users locate the last call based on its physical connection.

## Exterior telephone posts (PTE)

These hands-free telephones let train drivers get in contact with station traffic managers at the closest station ahead of or behind them, or with the train traffic regulator. The group offers a large line of exterior telephones using the landline network, GSM-R

network or Ethernet (IP). With an anti-vandalism design and climate resistance (frost, salt, ultraviolet rays, etc.), these posts with automatic diagnostic capabilities can receive remote maintenance or energy through solar panels.

# Vossloh Cogifer services

We are always focused on meeting customer needs, offering a full range of services.



Geometric assessment of a point and crossing, Nice, France

## Turnkey devices

### ■ Pre-project services

In the lead-up to a project, we can plan reliable, lasting solutions for customers, thanks to our diverse offer: location studies, route recommendations, point and crossing design consulting, as well as rail/wheel studies.

### ■ Project services

To help implement our customers' projects, we design

and manufacture railway safety devices. We handle pre-assembly and reception services in our workshops. In addition, we supervise storage and worksite pre-assembly, as well as the installation of our devices and their equipment onto tracks. Lastly, Vossloh Cogifer can also perform the final verification before commercial operation.

### ■ Post-project services

During commercial operation, we offer inspection, diagnostics, consulting on preventative or corrective maintenance, cleaning and renovation services. We also provide regular assessment services through multi-year follow-up contracts for all equipment operated within a single network.

### ■ Training

Vossloh Cogifer develops partnerships with customers by offering training programmes on installing, operating, cleaning and maintaining our products. Training sessions can take place at our training centre in Reichshoffen, France, or directly on the customer's site.

Geometric assessment of a point and crossing, Nice, France



## Expertise

Our service specialists offer high-quality support to customers throughout our products' entire lifecycle and for all types of networks: conventional tracks, high-speed lines, rapid transit systems, tramways and special tracks.

# Imagining new railway safety

The aim of our Research and Development (R&D) teams' signalling projects is to design safety products and high-performance signalling



Production, Reichshoffen, France

## Safety, a constant objective

R&D from the Vossloh Cogifer Signalling Department and its subsidiaries is organised around two axes:

- **optimising** existing systems by adding new capabilities,
- **designing new product** lines that respond to specific customer demands or the particularities of given networks.



New saw drill, Reichshoffen, France

## Modern, high-performance technical resources

Safety product studies are performed in an office equipped with 3D CAD software, allowing for adjustments to fit customer needs and the development of new products. Studies for signalling and remote maintenance systems are performed using:

- **CAD posts** specialised in building electric diagrams that comply with railway standards,
- **development tools** and platforms for validating and testing software intended for computerised signalling and track monitoring installations.

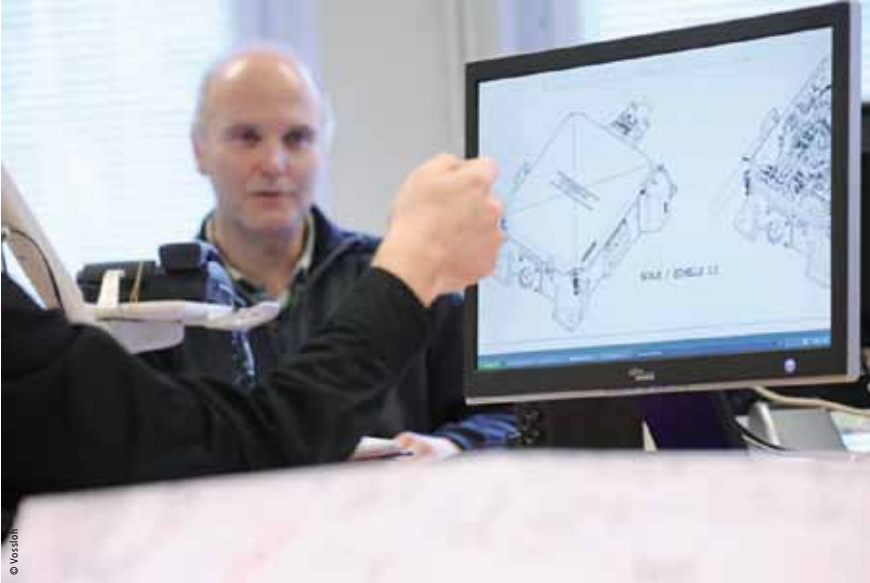
The Signalling Department's production tool makes it possible to produce prototypes and perform test benches, while also completing standard production. Assembly of our products is monitored via computerised posts.

## A turnkey offer

Through its engineering and research centre, our Signalling Department regularly produces turnkey signalling installations that integrate systems dedicated to interlocking stations, automatic and manual blocks, level crossing mechanisms, etc. Our services also include related offers such as training and maintenance.

# solutions

systems adapted to all types of railways that comply with various regulations throughout the world.



Meeting, Reichshoffen, France

## Industrial excellence: a state of mind

At Vossloh Cogifer, industrial development and excellence mean continually seeking new ways to work and produce in order to better satisfy our customers. This pursuit of excellence is organised around five improvement areas:

1. Continuous training of personnel helps our employees to improve the quality of their work and efficiently carry out our improvement projects.

2. A lean manufacturing approach helps to identify and eliminate efficiency gaps throughout the entire company. It notably aims to optimise flows within group entities (organisation of production, work posts, etc.).

3. The introduction of key performance indicators makes it possible to measure the performance of employees

and group entities in critical areas of our activities, such as customer service, safety, environmental respect and quality assurance.

4. The simplification of management processes applies to all areas, including the entry of customer orders, delivery plans and financial reports. It is put into practice by informing and training teams.

5. The identification of best practices throughout the company promotes the best solutions developed by all group entities.

To pursue these objectives, Vossloh Cogifer employs a participatory approach. Teams devoted to industrial development and excellence are responsible for properly managing changes and encouraging employees to

provide new ideas.

Each idea is analysed according to several parameters (feasibility, production time, etc.), and employees systematically receive feedback.

This method has proven successful: in 2006, the Vossloh Cogifer plant in Reichshoffen, France, won the industrial excellence trophy awarded each year by the French magazine *Usine Nouvelle*, its German counterpart *Wirtschaftswoche*, INSEAD (European Institute of Business Administration) and the German management institute WHU (Wissenschaftliche Hochschule für Unternehmensführung).

**The Signalling Department's activities and sites received ISO 9001:2000 quality certification.**



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