



## Turnouts in extreme environments

 Specific technological solutions for desert areas

# Customized designs for the harshest environmental conditions



Switches and crossing turnouts and their subsystems (actuation, locking and detection) play an important part in traffic safety, whatever the environmental conditions facing them.

In desert areas, sand, high temperatures and extreme exposure to the sun are important considerations to be taken into account for trouble-free operation of this equipment.

Thanks to its extensive experience as network supplier for the toughest environments, Vossloh Cogifer has the capability of suitably addressing the most demanding natural conditions.

As a way of limiting maintenance difficulties, Vossloh Cogifer has developed appropriate designs to limit the effects of sand buildup, and components designed to resist the effects of temperature and solar radiation.

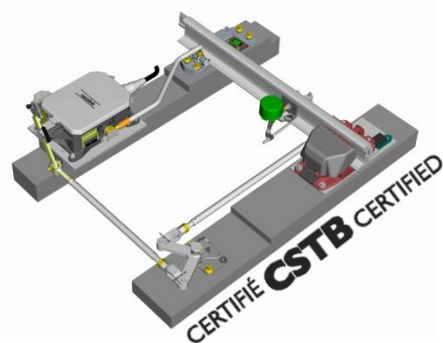
## Maneuvering devices tested in the laboratory

A wind tunnel test was performed to check the ability of the complete maneuvering device to operate in a sand wind.

The test was carried out in a **CSTB** wind tunnel (ISO and COFRAC certified laboratory) and is based on the superior highest standards (DEF-STAN 0035, MIL-STD 810 F, GAM EG 13) used to qualify the sand wind conditions for military materiel like helicopters, missile launchers or transport vehicles.

This involved projecting 3 tons of sand particles measuring between 20 and 200  $\mu\text{m}$  for 4 hours at operating device in order to reproduce the extreme conditions of a sandstorm.

**Maneuvers took place without any locking or detection failures out with the sand blown from 4 different directions.**



On each throw over, the lubrication free roding, the MCEM91's behavior, the locking control and point detector (VCC + controller) were verified.

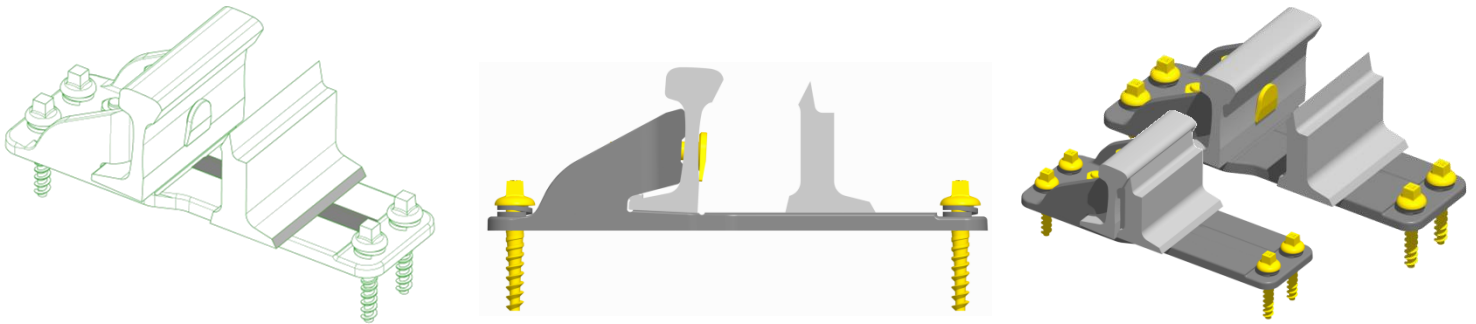
***No defects were found in the electric contacts. The complete system was found to operate faultlessly throughout the test.***



# Suitable solutions to resist the greatest constraints

## Switches and crossings with exclusive technology

- ▶ Maintenance free (lubrication free) switches and crossings
  - slidechairs not requiring any lubrication thanks to the coating (Cogislide or Nickel Chrome) on the sliding tables
  - rodings fully equipped with treated shafts requiring no lubrication



- ▶ Modifications of slidechairs by adding additional grooves to facilitate the evacuation of sand
- ▶ Machining of the switch blade foot to facilitate sand evacuation
- ▶ Thermal expansion devices adapted to major important ambient variations (-18°C to + 58° C)
- ▶ Anti-creeping system to limit the relative movement of the components
- ▶ Reinforcement of the switch blade tip to avoid any additional abrasion caused by sand when a wheel runs by

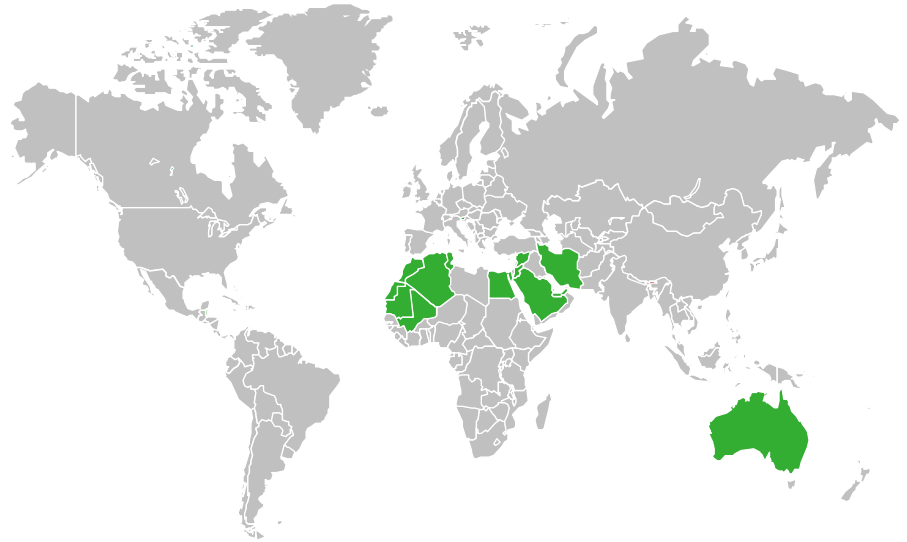


## Point operating equipments systems conforming to local conditions

- ▶ **Optimized point operating equipment**  
Switch locking devices with a reduced number of components to facilitate maintenance and sand clearing
- ▶ **Proven components:**  
Motors and controllers reinforced for sand sealing

## Solutions already proven in many countries with desert areas...

Algeria, Saudi Arabia, Australia, Egypt, Jordan, Mali, Morocco, Mauritania, Syria, Tunisia, UAE...



Thanks to its worldwide experience generated over almost 150 years, Vossloh Cogifer has the capability of developing new solutions involving technical innovations with a permanent concern to offer optimum safety while increasing considerably equipment life, under the toughest environmental conditions.



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