SIEMENS

Hong Kong (China) Tseung Kwan O Line

In order to equip the lines of its network with Automatic Train Control (ATC), the MTR Corporation (Mass Transit Railway Corporation) chose a proven system provided by several suppliers : SACEM. This choice guarantees that the MTR Corporation has a sustainable system and allows it to benefit from the advantages of multi-sourcing.

In 1999 Siemens, was entrusted with:
◊ Equiping the section between Yau Tong and Po Lam, called the Tseung Kwan O Extension with SACEM.
◊ Equipping the section between Quarry Bay and North Point with SACEM.
◊ Upgrading the existing ATC system in operation on the section between Lam Tin and Quarry Bay with SACEM.
◊ Equipping 13 trains with SACEM.
◊ Equipping the depot in Tseung Kwan O South (7 km of track) with SACEM.

SACEM performs ATP (Automatic Train Protection), ATO (Automatic Train Operation) and ATS (Automatic Train Supervision) functions. SICAS interlockings are supplied by Siemens for the 13 km long line. An automatic turn back function was also provided at the request of MTR Corporation.

Interoperability

The interoperability of SACEM is the technical translation of a multi-sourcing policy. SACEM is made up of wayside and on-board equipment which was developed by the suppliers owning the technology.

The challenge is to ensure interoperability between wayside and on-board equipment supplied by two different contractors i.e. to ensure that the global performance of the ATC meets the functional and performance requirements expressed by the MTR Corporation.

The technical challenge for Siemens was threefold:

◊ On the section between Yau Ma Tei and Lam Tin: ensuring interoperability between the trains equipped with SACEM by Siemens and the wayside system equipped with SACEM provided by another supplier.
◊ On the section between North Point and Po Lam: ensuring interoperability between the wayside system equipped with SACEM supplied by Siemens and the trains equipped with SACEM from another supplier.

◊ On the section between Lam Tin and Quarry Bay: ensuring an out-of-service migration so as to minimize the disturbance for the passengers during revenue service.

High transport demand and safety

The intelligence of SACEM is on-board. It means that the train computes its own speed curve on the basis of:
◊ Information of fixed block occupancy transmitted to the on-board ATC equipment by continuous wayside- to-train communication.
◊ Information describing the operation of the line.
◊ Individual characteristics of the train.

Thanks to its on-board intelligence, SACEM:
◊ Ensures a continuous speed control.
◊ Minimizes the interval between two trains, which also contributes in reducing the waiting time in stations.

Punctuality and availability

Strict requirements

SACEM has been enhanced with new functions for the management of fallback modes, thus increasing availability and leading to a better quality of service for the passengers.

Reduced operating costs

Two new functions have been introduced to meet the requirements concerning operating costs reduction:

◊ Coasting: optimisation of the consumption of traction power for each train according to the profile of the line.
◊ The interface with platform screen doors. Platform screen doors contribute to ensuring the safety of passengers in stations and in reducing air conditioning operating costs.

Key features

- ◊ Length: 13 km
- ◊ Number of stations: 7
- ◊ Headway: between 128 and 300 s
- ◊ Commissioning:
  - ◊ August 2001 from Lam Tim to North Point
  - ◊ August 2002 from Po Lam to North Point
  - ◊ September 2002: depot.
  - ◊ Lohas park extension commissioning is planned to 2009

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