

Customer Success Story

- Gotthard Base Tunnel -
Orianda implements the
Maintenance Management Tool
for the longest railway tunnel in
the world.



Image source: Transtec Gotthard

SIEMENS

With a route length of 57 km, the Gotthard Base Tunnel (GBT), is the longest railway tunnel in the world and the construction of the century. It forms part of the New Railway Link through the Alps (NRLA), which provides a fast, efficient rail link running through the Alps using minimum gradients and wide bends. To ensure safe operation, Orianda implemented the Maintenance Management Tool for maintenance planning.

Starting point

With the two single-track tunnels, 178 cross passages, 2 multifunction stations and the access routes, the entire tunnel system measures a total of 151.8 km. The tunnel control and communication system in the tunnel control centre, which is responsible for the management and execution of all operational processes, is the linchpin for monitoring, operating and controlling the electromechanical systems. Implementation of the Maintenance Management Tool (MMT) was undertaken by Orianda Solutions AG on behalf of Siemens Schweiz AG. The MMT is an integral part of the tunnel control and communication system performance package.

Objective

The objective of the Maintenance Management Tool is to optimally support the planning of the maintenance activities. This calls for accurate planning with regard to

train formation, train load, materials, personnel and workplaces.

Challenges

The tunnel does not have any access adits, which means that maintenance of the tunnel is only possible by train. The workplaces are defined and assembled anew for every shift. A workplace represents the location at which the maintenance assignments are performed. To enable flexible bundling, the job orders need to have a fine granularity; however, this increases the complexity of the job order planning.

User-friendly user interface

Order scheduling is one of the central functions of the Maintenance Management Tool. The job orders are bundled fast and efficiently into workplaces by means of user-friendly user interfaces. Staff capacity overviews and scheduling functions are available for planning, so that the maintenance planner can make optimum use of the maintenance intervals. The corresponding wagons and engines are allocated to the workplaces using drag and drop.

The wagon scheduling automatically distributes relevant information to all job orders and materials. This is particularly important for the communication with the maintenance personnel and material logistics. ▶



Project Overview

Peter Müller, Siemens Project Manager LP60

The order for the tunnel control system including peripheral systems from Alcatel-Lucent SA, as part of the Transtec Gotthard Consortium, is an important order for Siemens AG. The tunnel control system monitors and controls all systems in the tunnel. Errors or irregularities are displayed online so that the technical operator can react immediately. The Maintenance Management Tool is an important component, enabling the operator to support the entire system. Thanks to Orianda's experience, we have been able to implement this part to our customer's satisfaction.

Sophisticated maintenance system

- Drag & drop functionalities → less clicking
- Minimisation of errors by conflict checking
- Fault management
- Simple scheduling of workplaces
- Train formation planning
- Information management: information for maintenance personnel and materials logistics

Basic data on the Gotthard Base Tunnel:

- 2 x 57 km single-track tunnels
- 13 km newly constructed open section
- 178 cross passages
- 2 multifunction stations with track crossover
- 500 km drainage pipeline

- As a result, the material schedulers know which materials need to be loaded on to which wagon and engine.

Fault management

The electromechanical systems send status and fault messages to the tunnel control and communication system, which are then displayed on a monitor. If the messages are maintenance-relevant, these are then passed on to the MMT to generate orders for the next interval. Due to the impact of current incidents, the planning must be continuously updated to reflect the latest order and incident situation.

Master data structures as prerequisite

All installation systems are registered in the Maintenance Management Tool. Concepts were devised for structuring and migrating all maintenance-relevant objects for mapping. The objects range from linear objects, such as rail tracks, to the telecommunication systems. The system knows who supplied the components, where the respective spare parts are stored and how the components are replaced, what qualifications are required for the maintenance work and where the manufacturers' maintenance manuals can be found.

Trial run

To ensure optimum operation, a six-month trial run is being performed. This is being used to collect information before normal operation begins. Any insights will be incorporated into the work schedules and work sequences, so that initial

improvements can be made even before the tunnel is completed.

Outlook

In implementing this solution, we took great care to use the SAP standard and user-friendly user interfaces for the Maintenance Management Tool. As a result, the solution can be quickly and simply extended to the Ceneri Base Tunnel.



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