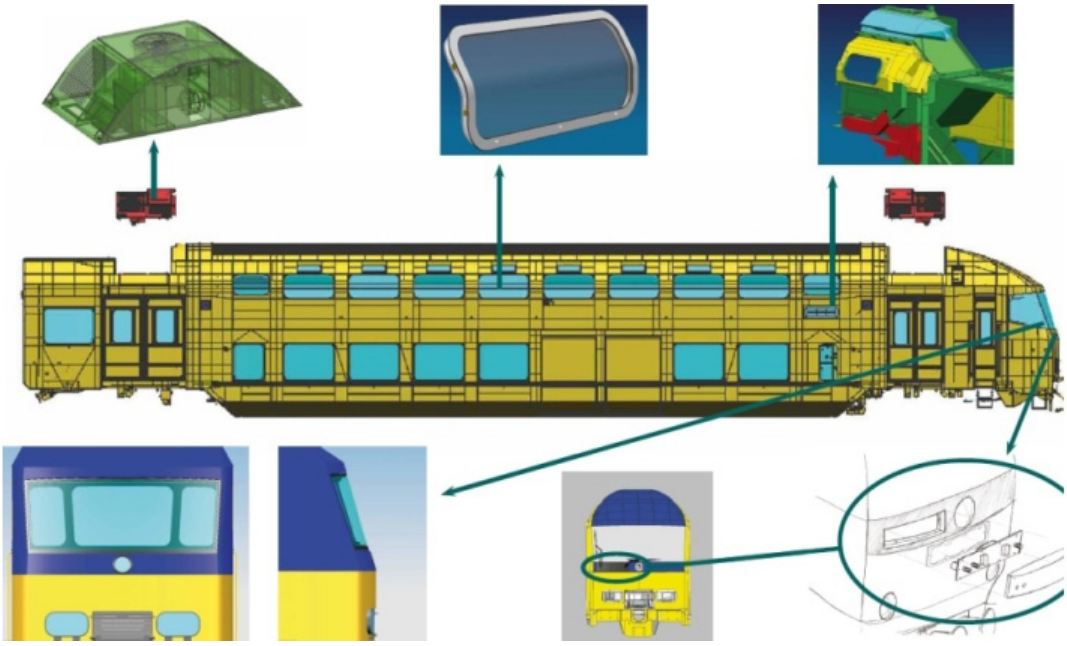

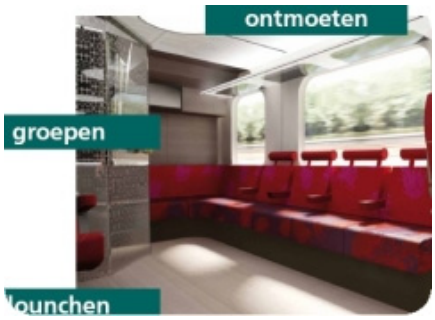

Customer
NedTrain Haarlem

Location
Dutch Railways

Date of delivery
December 2013

Summary
- Co-design between Strukton Rolling Stock and the customer for engineering carriage cabling
- 5 Documentation sets for new installation of cabling for the ABvk, Bv1, ABv, mBk and Bv2 carriages
- 200 Cabling sets for the ABvk, BV1, ABv and mBk carriages
- Optional: 50 cabling sets for the ABv and Bv2 carriage
- Provide support to NedTrain during assembly and test activities related to the pre-tryout phase

Transformation of DD-AR trains into DDZ trains

NS Reizigers commissioned the modernisation of train equipment for the DD-AR (DDM-2/3) type, including mDDM carriages. These renewal activities will be combined with long-term maintenance. In 2009, NedTrain Haarlem was commissioned to modernise the first line, which includes 200 carriages – a total of 50 trains of 4 carriages – with an option of 50 more carriages.

NedTrain commissioned Strukton Rolling Stock to take care of the engineering and delivery of prefabricated bundles of cables, along with the accessories needed for the various new or revised systems. Strukton Rolling Stock will also be carrying out supporting activities for NedTrain, both during the engineering phase and the assembly and test phases of the pre-tryout.

The double-deckers were built in 1985, and the standards and requirements set for these carriages have changed significantly since then. Trains are made up of a complex body of safety systems and numerous subsystems. Cabling is needed to control and supply these systems with power. In addition to technical suitability, the cabling must satisfy new flammability and environmental requirements, for example.

Strukton Rail

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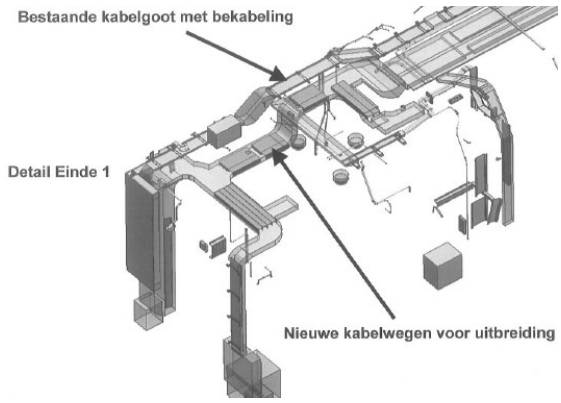
Modernisation

New partitions, ceilings and seats will be fitted in the DDZ trains. Additionally, various electrical systems will be renewed or adapted. For example, the lighting units will be replaced and modern air conditioning units and transducers will be installed. An infotainment / on-board information system will also be fitted. In addition to the cabling needed for the new and/or revised systems, all continuous cabling will be replaced as well.

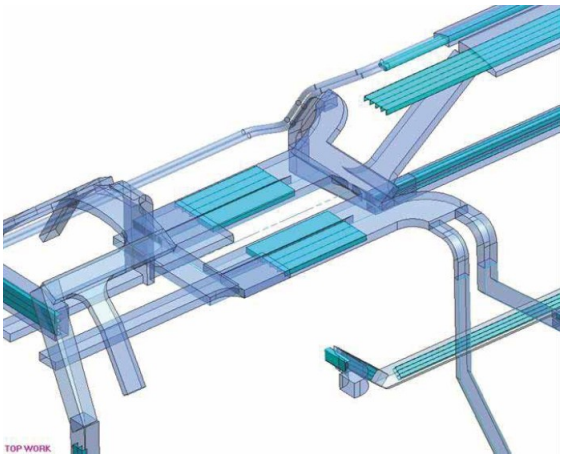


Co-design

Strukton Rolling Stock will deliver the prefabricated bundles of cables in as complete a form as possible, taking account of the existing situation and available options. During the design phase, Strukton Rolling Stock and NedTrain will carefully coordinate the different design details to arrive at optimal solutions.

Logistics

Delivery for the first pre-tryout (PTO) is set to take place in September 2010. The remaining carriages will follow after that. The four different PTO carriages will be connected into a single train for thorough testing. End-product construction will follow the pre-tryout and tryout phases; the last train will be delivered in 2013. NedTrain will operate a production line with fixed scheduled activities taking place at each working position. In order to optimise throughput time, deliveries for each carriage will be made two weeks prior to commencement of the activities at each position.



Pre-tryout support

Bodywork for the double-deckers is located at the NedTrain workshop in Haarlem, where the entire modernisation process will be carried out. During assembly and testing for the pre-tryout and tryout phases, Strukton Rolling Stock will support NedTrain with respect to the electrical systems.

Further details

Given the nature of the project, the respective parties will need to cooperate closely in order to deliver the carriages as scheduled. Keeping to the schedule is critical in view of the limited amount of time available for engineering the adjustments and the short start-up period for on-site assembly before the pre-tryout phase.

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