OpenTrack-Training in Riyadh
Planning the future Operations
on the SAR Network

Presentation at nextRail17, 8th September 2017
Jürg Suter
1. Overview of SAR Network
2. Application of OpenTrack at SAR
3. Task and structure of the training
4. Realization in Riyadh
5. Conclusions: Exchange of experiences
1. Overview of SAR Network

http://pkonweb.com/saudi-arabia-seeks-private-partner-for-rail-operations/, 10.08.2017
1. Overview of SAR Network

Mineral Transport
1. Overview of SAR Network

SAR: Saudian Railway Company
(Nord-South line)

Mineral transport

- Traction:
  - SD 70 locomotives
    22.6 m, 186 t

- Trains:
  - Phosphate and Bauxite transport
  - Train with 155 wagons
    4,650 t (empty), 20,150 t (loaded)
1. Overview of SAR Network

Passenger Service
1. Overview of SAR Network

**SAR: Saudian Railway Company**
(Nord-South line)

**Passenger service**

- Day Compositions:
  - CAF trains
  - 9 passenger cars

- Night Compositions:
  - CAF trains
  - 13 passenger cars
1. Overview of SAR Network

Mixed service
1. Overview of SAR Network

Special conditions for operation management

- Infrastructure / Network:
  - Single track lines (1’361,3 km)
  - ETCS level 2
1. Overview of SAR Network

Special conditions for operation management

- Operation:
  - No fix time table (mineral trains)
  - Speed differences
    (80 km/h – 200 km/h)
1. Overview of SAR Network

Special conditions for operation management

- Environment / Weather:
  - Sand storms
1. Overview of SAR Network

Operation management

- Operation Centre in Riyadh
  - Safety installations by Thales

- Intervention teams in the field
2. Application of OpenTrack at SAR
2. Application of OpenTrack at SAR

Planification of Operation processes

- Create fix time tables for mineral trains
  - Better commitment of staff and rolling stock
  - Coordination with future passenger services
  - Investigations of incidents and delays

- Preparation of new requirements
  - Changements of transport volumes and rolling stock
3. Task and structure of the training

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3. Task and structure of the training

Structure of the training

Module 1: Basic knowledge
Module 2: Exercises
Module 3: Modelling of a SAR line
Module 4: Application and repetition

The participants...

... know the basic structure and the philosophy of operation of the tool OpenTrack,
... are able to model any railway line topology in an independent way,
... can build rolling stock, trains and time tables,
... can perform simulations independently and evaluate them,
... are able to prepare concrete experiments according to requirements and to evaluate them based on the simulation data.
3. Task and structure of the training

**Theory and exercises**

- Based on the OpenTrack Documentation and standard training
- Focussed on particular interests and requirements of SAR
4. Realization of the training in Riyadh
Contribution of OpenTrack

- Support the design of time tables under real conditions
  - Calculation of journey times of different train categories
  - Impact of incidents

- Planning of mixes service (mineral trains together with passenger trains on a single track line)
4. Realization of the training in Riyadh

Solution in five steps

1. Analysis and understanding of the system
2. Elaboration of Infrastructure data
3. Modelling of infrastructure
4. Modelling of rolling stock
5. Design of timetable variations
4. Realization of the training in Riyadh

Modelling of a SAR line
4. Realization of the training in Riyadh

Modelling of a SAR line

First step:
To analyse and understand the system
4. Realization of the training in Riyadh

Modelling of a SAR line

First step:
To analyse and understand the system
4. Realization of the training in Riyadh

Modelling of a SAR line

First step: To analyse an understand the system
4. Realization of the training in Riyadh

Modelling of a SAR line

Second step: Establishment of infrastructure lists

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4. Realization of the training in Riyadh

Modelling of a SAR line

Third step: Modelling of infrastructure
4. Realization of the training in Riyadh

Modelling of a SAR line

Fourth step: Modelling of rolling stock
4. Realization of the training in Riyadh

Modelling of a SAR line

Fifth step: Modelling of timetables
4. Realization of the training in Riyadh

Modelling of a SAR line

Fifth step: Modelling of timetables
4. Realization of the training in Riyadh

Modelling of a SAR line

Fifth step: Modelling of timetables
4. Realization of the training in Riyadh

Simulations

Creating scenarios for planning of operation
- Test timetable options
- Delays and Incidents
4. Realization of the training in Riyadh
5. Conclusions: Exchange of experiences

- Enough time to provide and find the data
- Theory and practice
- Expectations and use of the tool: OpenTrack doesn’t take your responsibility