SWISS SECTION

Reports by George Raymond and Heinz Walser

On November 25 the IRSE Swiss Section got an inside look at a major centre for teaching and research on railways. We visited the Institute for Transport Planning and Systems (IVT) of the Swiss Federal Institute of Technology (ETH) in Zurich.

ETH has some 17 000 students and ranks among the world's top 25 universities and Europe's top six. Sixty percent of professors and PhD students are non-Swiss. Nine of ten graduates find jobs within three months.

"Our product is to ask good questions and deliver good answers", said Professor Ulrich Weidmann. IVT's main teaching and research domains include system and network planning, dimensioning and capacity, including infrastructure and rolling stock; system management, marketing and quality; and railway safety and reliability. IVT courses lead to a bachelor's degree, whose emphasis is practical, and a more scientific master's degree. Alumni go to work for transport operators, suppliers and planning organisations. Professor Weidmann pointed out that although Swiss transport salaries are lower than in finance and medicine, they exceed those in IT, machine building and construction.

Three PhD students presented their research. Sabrina Wiedersheim is applying operations research methods to quickly generate fixed-interval timetables so that strategic planners can easily compare widely different timetable concepts. To reduce computation time, the approach is "macroscopic": it takes into account tracks, train stops, connections and train separation, but not detailed track topology. A major question is how to divide a rail network – for example, the Luzern region – into manageable sub-zones for faster computations and checking.

Steffen Schranil is working on predicting the duration of operating incidents as the basis for dispatching and passenger information. This involves understanding the process – including detection, reporting, classification, diagnosis, prognosis and correction – by which a *technical* incident on a train or trackside element becomes an *operational* incident affecting a number of trains. This understanding is critical on high-density networks like Switzerland's. Statistics on past incidents help estimate the duration of new incidents of the same type. Also critical for dispatching decisions and passenger information is knowledge of remaining line capacity during an incident.

Patrick Frank is examining the allocation of rail infrastructure capacity. Capacity consumption depends on paths and how similar ones are grouped, but also on delay risks due to under-powering, long paths and waiting for connections. Each stakeholder – including the operators of the different types of passenger and freight trains, infrastructure operators, integrated railway groups, customers and political leaders – has a different viewpoint. The research is determining the cost of providing infrastructure, the value of the various train types to each stakeholder and how levers like path prices and regulation can raise the total value of operations.

We then went downstairs to the ETH model railway training layout, successive generations of which have been running since 1955. In 2011, the layout was rebuilt by IVT (trackside installations), Siemens (interlockings) and iRFP Dresden (intermediate IT connections) in an effort financed by ETH, SBB and Siemens.

The HO-scale layout's 600 metres of track represent 15 route-km. We ran trains from six interlockings, including a Siemens & Halske machine from around 1900, an Integra electro-mechanical installation from the 1950s and Domino 67 panels, one of which controls a fully-fledged relay interlocking. An ILTIS installation (the Integra/Siemens Control and Information System - **I**ntegrales **L**eit- und **I**nformations**S**ystem) can control the whole layout, on which ETH and SBB trainees operate trains to a timetable.

Additional treats were films from Dresden on the inner workings of mechanical interlockings and the Soviet EZMG interlockings, whose technology, logic and signal aspects still control a number of small German stations.

Our Chairman Markus Montigel and "staff" *at* ...

... and after work!

At the IRSE Swiss Section's business meeting, Chairman Markus Montigel introduced ten new attendees. Since 2003, the Section's membership has grown from a small number to 56, and it has registered 18 prospective members. A proposed change in the Swiss Section's bylaws would let companies become affiliates. He also emphasised the importance to participate in the IRSE Convention 2012 in London, in order properly to celebrate IRSE's 100 anniversary.

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Upcoming IRSE SWISS SECTION events in 2012:

- **7 March**, time approx. 14:45 – 20:00
  1st Annual Meeting of the **IRSE SWISS SECTION**
  With visit to the gauge-change facility of the MOB/Golden Pass in Montreux/Lake Geneva;
- **15 June** (possibly also **16**):
  Event to be determined;
- **9 - 12 and 12 - 15 September**:
  ASPECT 2012 and 2012 International Technical Convention in London, planned with a special **SWISS SECTION** event in London during the IRSE activites.