SWISS SECTION

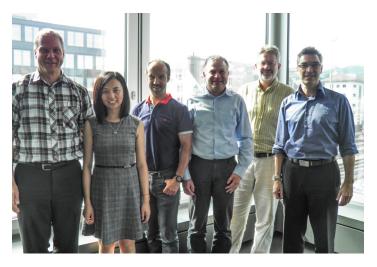## 'Paper Session' at the Swiss Section
Brian Smith IEng MIET FIRSE

On the first floor of the North West Switzerland University of Applied Sciences and Arts (FHNW) there is a well appointed Seminar Room which also commands a spectacular view of the railway junction at the southern approach to Olten Station. And so it was that twenty one IRSE Swiss Section Members and eight guests assembled there on the afternoon of Friday 16 June for the Section's annual 'Paper Session'.

Four 'papers' were in the program, all related to the overall theme of remote control. Our Section's Chairman, Daniel Pixley, kept his opening remarks short and quickly gave the floor to the first topic.

This was introduced by Alfons Noti from the Gornergrat Bahn, (GGB) a rack railway, which links the village of Zermatt to the summit of the Gornergrat Mountain, from which one can admire the towering peak of the Matterhorn. Herr Noti told us how the railway had three problems, a life expired traffic control system, no money for capital expenditure and, as a privately owned 'tourist' railway', no access to public subsidies. Daniel Bröniman from Siemens Switzerland took up the story to explain how they had been considering the possibility of 'leasing' traffic management capacity on a centrally located ILTIS TMS to smaller railways via a 'cloud based' remote connection. Herr Boniman described this as a "no worries package" for smaller railways giving them access to the full features of a powerful TMS complete with stand by and back up facilities, on servers always running the latest software on up to date hardware. Between them the two presenters explained the development of the engineering solution subsequently offered by Siemens to GGB. This has recently been commissioned and is now working satisfactorily with the ILTIS System in Wallisellen, some 200 km distant from Zermatt, controlling the GGB Railway's 9 km route which includes two terminal stations, three passing loops and two sections of double track. The basic half hourly service is often supplemented by extra trains introduced at short notice, in response to the fluctuations in passenger numbers, and a requirement was that the ILTIS system be capable of responding to these needs.

The discussion which followed the presentation was lively, with an unusually high proportion of the members wanting to participate! The recurring theme was security 'in the cloud,' about which we heard from the presenters of the extensive testing methods used and even the employment of 'experienced Hackers' in an (unsuccessful) attempt to disrupt the system.

BLS, Switzerland's second largest standard gauge railway and operator of the Lötschberg Base Tunnel, started a gradual but continuous program of 'Migration from Manual Process to Digital Support' in 1996 and the second 'paper' in our session, presented by Adrian Mosiman, brought us up to date with their progress. The target was and is, to have integrated digital systems in place by 2020 to cover the automation of the complete operation of the Railway. This target includes, initial planning, development, control, operation and train movement. Herr Mosiman described how incremental progress towards this ambitious goal has been, and is still being, achieved. Systems already well established include ETCS train protection, 'ILTIS' Traffic Management and, for trains through the Lötschberg Base Tunnel, a Driver Advisory System (DAS) as well as applications for maintenance and fault intervention management. A central
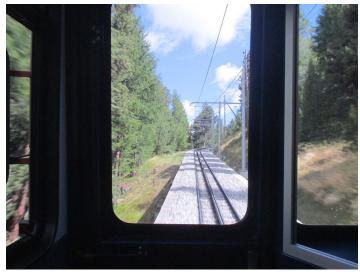

Speakers at the event with our Chairman. From Left to Right: Swiss Chairman Daniel Pixley, Dr Xiaolu Rao, Markus Enzler, Alfons Noti, Adrian Mosiman, Daniel Boniman.

element of the full program is to have an automated interface to communicate changes of train routes from the traffic disposition system to the route setting system. This interface is currently in the final stages of preparation and will go into operation this year. We heard that; whilst 2020 remains a very ambitious target, progress made to date has proved reliable and brought measurable benefit to the operation of the railway.

The main theme in the discussion of this 'paper' was obsolescence management, especially important in an ongoing 25 year program of digitalisation! With his answers Herr Moniman was able to assure us that this was indeed being given serious consideration at all stages of the development and implementation.

Markus Enzler, of the Regional Transport Bern-Solothurn (RBS), then took to the floor to present his 'paper' describing the continuing development of the remote control / traffic management system being used on the RBS railway. This is a metre gauge network of some 45 route-km connecting Bern with Worb and Solothurn. The four RBS platforms in Bern's Main Station are underground and handle the arrival and departure of 550 scheduled passenger trains each day. RBS Trains clock up 3.7 million km per year and carry 25 million passengers. Punctuality is paramount and we heard that to obtain consistent train arrivals within a minute of the advertised time, planning needed to be done in intervals of tenths of a second. Again, we were told of an ongoing continuous program of well considered upgrades, which remains the key to this success. Having the advantage of being the third presenter, Herr Enzler pre-empted the inevitable obsolescence questions from the floor by explaining how the RBS had an active life cycle management plan in place!

Questions therefore centred on the achievement of sufficient system reliability and mitigation measures for failures. We learnt that while normal operation was all done from the remote control system, with the assistance of automatic route setting, RBS still maintained local control panels at all its stations and most importantly had local staff, normally present on other duties, trained in their use.

Three views of the Gornergrat Bahn, subject of the first paper.
Top left, view from the cab shortly after leaving Zermatt.
Above, view from the cab on the higher double track section, note the 3-phase overhead line equipment and the Matterhorn already 'in the cloud' in the centre.
Left, about to depart from the Gornergrat summit station.

The final 'Paper' of the day took us into the theory behind bringing Automatic Train Operation (ATO) to mainline mixed traffic railways. Dr Xiaolu Rao, of Systransis AG, gave us an insight into "Holistic rail network operation by integration of train automation and traffic management". She described the railway as being in three interrelated 'parts': infrastructure, operating rules and train movement. We learned that, a successful ATO System has to bring these three 'parts' together in a continuous calculation of the alternative movement options available in the infrastructure in order to implement the movement authorities necessary to achieve the best fit with the timetable requirements.

She stressed that, existing system weaknesses cannot be resolved by applying ATO and explained how the application of the most appropriate level of 'grade of automation' for a particular situation is necessary to bring benefit in each particular case.

Once again a lively discussion followed Dr, Rao's presentation. In particular, members' questions concerned the resolution of the discrepancy between theoretical train performance and the everyday reality, the computing power necessary to achieve useable outputs in real time and the need for bidirectional communication between the train and the infrastructure. Just in case any readers of IRSE News should get the impression that this is all 'wishful thinking' for the future, it's important to note that the Driver Advisory Systems already bringing benefit to train operations in both the Lötschberg and Gotthard Base Tunnels are products of Dr, Rao and her Colleagues at Systransis.

Before the chairman closed the proceedings he called on Jens Schulz to give the meeting an update about the activities of the International Technical Committee and the impending publication of the new report about relays.

Our thirst for knowledge well quenched, members and guests retired to the nearby restaurant Flügelrad where attention was given to the quenching of a more tangible kind of thirst!