

Fledgeling Giruno

The design work for SBB's new EMU for NEAT operations (Neue Eisenbahn-Alpentransversale, see R 3/14, p. 41) is progressing. Stadler's Bussnang works has now built a number of mock-ups to optimise interior design. One mock-up, for instance was intended purely to fine-tune the desired interior illumination of the trains.

The mock-ups were made available for inspection until 1 May 2015, and were inspected by over 200 rail industry professionals from a variety of origins, and their observations were recorded. These resulted in 270 different suggestions for optimisation, of which 80 % were considered significant. The suggestions and modifications were then duly implemented in the design by 27 August 2015.

How The NEAT EMU Project Developed

In 2004 Cisalpino, the SBB/Trenitalia joint venture, ordered 14 187 m long Class ETR 610 New Pendolinos from Alstom. These were delivered in 2007, and used on international services linking Switzerland with Italy. Cisalpino was dissolved in 2009, and the trains were shared out between the two operators, each receiving seven.

With the Gotthard Base Tunnel (GBT) being inaugurated in 2016, SBB would need new trains for its services to and from Italy, so it was rather inevitable that in 2012 the operator placed an order for another eight New Pendolinos. There was then no existing alternative to the ETR 610s, since no other suitable types had been authorised for operation in Italy. The additional ETR 610s were duly built, and were put into service in late 2014.

In the meantime, SBB conducted further in-depth passenger market research, concluding that these trains would still be insufficient to meet the anticipated demand after 2016. As SBB did not want to use locomotive-hauled rakes of stock for its international services via the GBT, in early 2015 it placed a further order with Alstom for four

more ETR 610s, these to be ready for regular service by late 2016. It should be noted though that the ETR 610 has not yet been authorised for use or for tilting in Germany, although extensive testing there is at present taking place.

However, the original Cisalpino contract for ETR 610s only allows a limited number of trains to be purchased. Therefore, in 2012 SBB decided to invite tenders for 29 single deck 200 m long trains without tilting technology, designed for operation off 15 and 25 kV AC and 3 kV DC, for trans-Alpine services via the GBT. In readiness for the start-up of services these trains would have to be authorised for 250 km/h operation in Italy, Switzerland, Germany and Austria.

They would have to fully meet Switzerland's stringent BehiG (Behindertengleichstellungsgesetz - Disability Discrimination Act) requirements. SBB also specified that the trains should have at least 400 seats, of these 25 % in first class, and a dining car, situated between the two classes of accommodation. Tilting technology would not be required, since by the time of the new trains' delivery the GBT would be in use, thus eliminating the most sinuous stretches of track between northern Switzerland and northern Italy.

There were four serious bidders, and ultimately, following intensive negotiations, in May 2014 Stadler Rail was nominated preferred bidder. Then two of the other bidders, Alstom and Talgo, protested to the Swiss Federal Administrative Court (see R 4/14, p. 46). Later Alstom withdrew its protest, and following consideration of the claims by Talgo, the Court announced on 28 October 2014 that the contract should be legally be awarded to Stadler, and the follow-



Picture: SBB

ing day operator and manufacturer signed the binding contract, worth over 980 million CHF, for the new trains (see R 5/14, p. 30).

The New EC250 EMUs

To date Stadler has only built EMUs with a top service speed of 200 km/h, but recognises the growing potential for international trains capable of 250 km/h, and was thus prepared to invest over

10 million CHF in R&D relating to the EC250 project. The 11-car articulated trains will incorporate a good deal of tried-and-tested technology used in the FLIRTs, but essentially they will be of an entirely new design.

The trains will consist of four first class cars, six second class cars, and a dining car, this positioned centrally. All but two cars, one first and one second class, will have only one pair of 900 mm wide entrance doors, situated a third

Principal Technical Data

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| Track Gauge | 1,435 mm |
| Supply Voltage | 15 kV 16.7 Hz/25 kV 50 Hz/3 kV DC |
| Axle Arrangement | 2' Bo' Bo' 2' 2' 2' 2' Bo' Bo' 2' 2' 2' |
| Maximum Service Speed | 250 km/h |
| Power Rating | 6,000 kW |
| Maximum Tractive Effort | 300 kN |
| Total Length Over Couplings | 202,000 mm |
| Bogie Wheelbase - Powered | 2,750 mm |
| - Non-Powered | 2,700 mm |
| Nominal Wheel Diameter (new) | |
| - Powered | 920 mm |
| - Non-Powered | 920 mm |
| Maximum Bodysell Width | 2,900 mm |
| Maximum Height Above Rail Top | 4,255 mm |
| Tare Weight | 388.3 t |
| Seats | |
| - First Class | 117 |
| - Second Class, Fixed Seats | 286 |
| - Dining Car | 17 |
| - Wheelchair Spaces (first + second class) | 2 + 2 |



On the left, the mock-up of a first class saloon. Here the distance between seat backs is a generous 2,040 mm. The right-hand photo shows the mock-up of a second class saloon. In seating bays the distance between seat backs is 1,850 mm, while in rows it is 860 mm. Both in first and second class the seats are adjustable/reclining. Significantly a clear window view, unobstructed by window pillars, is provided from each seat.

of the way along their length, the entrance vestibules designed for a platform height of 760 mm. Floor height here will be 880 mm above rail top. The dining car will have access doors too, but these will be used only for the loading of provisions. The entrance doors will also be provided with two retractable steps to facilitate boarding both at 760 mm and 550 mm high platforms, the latter height being common in Switzerland.

To cater for wheelchair-bound passengers, the two cars adjacent to the dining car will have an extra pair of doors, which will enable barrier free access from 550 mm high platforms. Here the floor height in the vestibules will be just 682 mm. The difference between floor heights will be achieved using ramps, the highest sections of floor being above the bogies, at 1,150 mm above rail top. The wheelchair accessibility requirements specified by the BehiG mean that the low floor accesses will take up the space of at least 15 first class seats or 20 second class seats. Moreover, a considerable amount of design and constructive effort will be involved in creating these low floor areas.

The trains will be fitted with 12 WC cubicles, of which two will be wheelchair-accessible and one will be provided for staff use only. The standard-sized WC cubicles will be sexed: there will be three groups of facilities, with one cubicle for ladies only, another for ladies and gentlemen, and one incorporating just a urinal, for gentlemen only. A separate office compartment will be provided for use by the train manager. The

result of all these design requirements is that each of the 11 cars will have a different configuration.

Operation

SBB decided to brand the new train family Giruno, inspired by the Roman-sch noun for a buzzard („girun“). The first 26 trains will be named after the Swiss cantons, and the final three will be named after the mountain passes under which (and the tunnels through which) they will run, Gotthard/Gottardo, Ceneri and Simplon/Sempione.

The first new train is scheduled to start testing in late 2016, in readiness to enter service between Milano and Zürich via the GBT in 2019, one year before the Monte Ceneri base tunnel is expected to be ready for use (inauguration of the latter has now been put back one year, to 2020). The service will subsequently be extended north to Frankfurt am Main. SBB is also considering a service from Milano to Simplon and Genève, with Milano to Bern and Basel being another possibility.

In spite of the latter proposal, SBB will probably use the entire Giruno fleet on the GBT/Monte Ceneri corridor, for operational simplicity, and most likely will employ its ETR 610s on services via the Simplon line. There is a possibility that in the distant future all long distance domestic services in Switzerland via the GBT will be operated using Girunos.

The Milano to Frankfurt service will be two-hourly, once the GBT and Monte Ceneri base tunnel are both inaugurated. End-to-end journey time will be



The design of the Giruno's driving console is based on that of the FLIRT and KISS EMUs.

about seven hours, and the diagrams will require eight trains per day. Should the demand be such that the trains have to run in multiple, up to 16 trains per day will be needed. The Milano to Zürich service will have an end-to-end journey time of three hours, daily diagrams requiring four trains with two-hourly services, or eight, should demand result in multiple operation.

The remainder of the fleet could be used, out of peak periods, on a daily train to and from Venezia, a through service which existed until some years ago. Some Girunos could work as far into Italy as Torino or Firenze. SBB reckons that as services expand in the future, the Giruno fleet could increase, since

the operator has an option for up to 92 trains.

One potential area which Stadler could target for EC 250 contracts is Benelux. Although the SBB trains are triple-voltage, the design is that of a quadruple-voltage train, which could also run under 1.5 kV DC. But will other operators order a train which complies with the strict BehiG design standards? Yet even without the incorporation of these the EC250 looks set to break into other markets, as did the successful FLIRT EMU over a decade ago.

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Photos by author

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FLIRT MAV 2. Serie
STADLER

PRODUCT RANGE – IN COMPLIANCE WITH EUROPEAN RAILWAY STANDARDS



Power control components



Signal control components



Monitoring relays



Multifunction relay devices