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# The Swiss 'EMU' - The NPZ

Neil Wheelwright



This is the first in what Neil hope to be an occasional series on the SBB passenger motive power that has not been included in the most recent SRS publication – 'SBB Electric Locomotives Past and Present'.

SBB NPZ RBDDe 560109 approaches Grandvaux on an east-bound train on 2nd July 2009.

All photos: Neil Wheelwright

The SBB NPZ (Neuen\*Pendelzüge or sometimes Nahverkehrspendelzüge) was introduced in the mid-1980s to provide a secondary and branch line train that would improve the lot of the passenger and reduce operating costs. The NPZ 'units' are not, in the usual UK terms, an EMU as the power car, the RBDDe4/4 Class 560, is not semi-permanently coupled to the other coaches in the unit and, indeed, the coaches are not in fixed formations. However, as the smallest configuration is a power car plus driving trailer they are classified as an EMU for the purpose of these articles. It should be noted that the term 'NPZ' is

also often used for the similar sets, built to a squarer design initially for the BLS group and the BT, and which pre-date the SBB NPZ.

The SBB ordered four prototypes to thoroughly test the concept. The project started in late 1980 with a budget confirmed at the end of 1981. The units were completed during 1984 with the first passenger services between Fribourg and Thun starting in October. All four were in regular use during 1985. They earned the now rarely heard nick-name 'Kolibri' (humming bird), probably because each had a different colourful livery, much removed from previous SBB practice. Two were in a livery of light and dark green with red doors, one with red ends, and one without. The other pair were in blue and grey, one with red doors and ends, one with yellow doors and grey ends.

The sets were made up of five vehicles. At the outer ends there was a RBDDe4/4 carrying numbers 2100-2103, later renumbered to 560 000-003, and matching new-build second class driving trailers 'Type Br', with UIC numbers 50 85 29-35 900 to 903. In between were three refurbished loco-hauled coaches of standard type EW (Einheitswagen) I and II. These had been

SBB Domino RBDDe 560229 at Palézieux on 6 March 2013. This is one of the SBB sets fitted with automatic couplers.





refurbished and smartened-up, but the manual door system was retained, whereas the new vehicles had plug doors. The choice to re-use existing centre coaches was, in part, a consideration of costs, but also a recognition that: (a) perfectly useable stock was in hand; and (b) that when the outer coaches became due for mid-life rebuild, it was likely that technical changes would see the need for new intermediate coaches, at a time when the re-used coaches would be ready for withdrawal. This is what happened. These prototypes were used along with the production series sets, but were not put forward into the 'Domino' refurbishment programme (see below) and so were withdrawn and sold in 2007/8. Sets 560 001 and 003 went to the Montafonerbahn in Austria, 560 002 to the CJ, and 560 000 to the OeBB.

NPZ series production commenced in 1987 with an order for 30 units. This was quickly followed by one for another 50 units. The numbering continued from the prototype series as 2104-2183 - plus 2184/5 of 1989, that went to the PBr (see below). An additional order for another 42, which were numbered in the new SBB style from the start as 560 100-141, took the total for SBB to 126. Twelve units built for private railways brought the overall total to 138, the last being delivered in 1996. The production livery was the now familiar blue and grey with red ends and yellow doors. Nearly all the sets were named after smaller communities, displaying the appropriate coat of arms between the driver's and baggage doors.

The units were constructed by groups including - FFA/SWP/SIG (Bogies)/BBC (electrics) for 2100-83; SIG (Bogies)/SWP/ABB (electrics) for the remainder - except BBC electrics for the PBr sets (see below). The production driving trailers were numbered 29-34 904 to 983 and 29-35 900 to 941 for the later batch. Technical details for the RBDe4/4 are: weight - 70t; maximum speed; 140kph; seating capacity: 56 second class; power rating: 1650 kW / 78kN continuous, 182kN maximum.

Units operated either as a minimum RBDe4/4+Bt, most notably on the 'Train des Vignes' between Vevey and Puidoux-Chexbres, or with one to three intermediate trailers - the minimum of which would usually be a composite coach. Units could work in multiple including with locomotives. Although there was a matching driving trailer for each power car there was no fixed link between two driving vehicles, and configurations changed over time. The centre coaches consisted of over 200 EW1 second class (B) and EWII composites (AB). Their refurbishment for NPZ service included an R4 ('heavy') overhaul, asbestos removal and a number of technical improvements. From the passenger's perspective,

SOB NPZ RBDe 561082 departing Rapperswil at the rear of a *Voralpen Express* destined for Luzern on 22 June 2015.



Montafonerbahn NPZ driving trailer ES 10.208 at Schruns depot alongside ex-OBG Transalpin EMU ES 10.205 on 8 July 1998.

the proportion of non-smoker seats was increased (up to 100% in the last batch) and in the later batches, the over seat luggage racks removed, replaced by longitudinal racks along the ceiling. Automatic plug doors were installed from 1992 to allow one-person operation. After this latter refurbishment, many of the intermediate coaches were also used in non-NPZ trains.

#### There were two sub-classes -

**Class 561** - These six units were modified in 2003 from the main series as 561 000-005 and designed to run in Germany on the Basel S-Bahn route to Zell-im-Wiesental. They were subsequently replaced by Class 521 Flirt EMUs in 2006, and have since been returned to being Class 560. The driving trailers used were also renumbered, as 29-35 960 to 965. Units 561 171-174 of 1994 were ex-MThB (566631-4). They were numbered into Class 561 as they were also configured for use in Germany.

**Class 562** - Six units were modified in 1997 from the main series for use in France under 25kV AC, for use on the Basel S-Bahn route to Mulhouse and numbered 562 000-005. These units can now be seen on general duties around Neuchâtel where they are used on the three daily trains to Pontarlier and Frasné in France to connect with TGV services







SBB NPZ RBD 562003 in Basel St. Johann under 25kV catenary on 14 June 2010. The large 'R' on the side is part of the corporate identity for the Basel regional network.

between Lausanne and Paris. These units will not be included in the Domino refurbishment. Their driving trailers were renumbered to 29-35 950 to 955.

**'Domino' Refurbishment** - As had been predicted, when the NPZ units came up for refurbishment in 2008, passenger and technical requirements had changed. This rebuild project, which had the name 'Domino', provided significant upgrades to the power cars and driving trailers, adding air conditioning; requiring changed windows; CCTV; passenger information systems; multi-functional spaces, etc., as well as considerable technical upgrading. The Bt became ABt, or At for the two sets that became the Glarner Sprinter units. Seating was reduced to 48 in the power cars - in the driving trailers to 12 first/ 48 second in RegionAlps sets, and 24 first / 32 second for general SBB sets. As part of this, a number of new intermediate 'Inova' coaches were built by Bombardier. These included low-floor and step-free access and disabled-accessible toilets.

Two subclasses were created; 560 401-416 (originally to be 13 units) for the RegionAlps joint venture with TMR to run between Visp and Martigny / Monthey / St Gingolph. These sets also have automatic couplers installed and run as

three-car sets. They are numbered as 'sets' RA01-RA16, so are now very much EMUs! The driving trailers are numbered 39-43 941 to 956. Other sets are numbered 560 201 to 303, which include the two sets that were used on the 'Glarner Sprinter' services from Zürich HB and Schwanden that operated between 2009 and 2014. The driving trailers are numbered 39-43 801 to 903 (19-43 801 to 802 for GS). The three extra RA sets were taken from within this batch. The original intention was to refurbish all the SBB and Travys sets but when the process was complete in 2013 only 116 (plus 2 reserve) sets were included and fewer than originally expected intermediate coaches built, 142 rather than 190.

### NPZ units with 'Private' Railway Companies

Twelve units were ordered by 'private' railway companies, and several more were transferred to them.

**Sudostbahn (SOB)** ordered four two-car NPZ sets (566400-403) but with driving trailer composites (ABt), which were delivered in 1995. The SOB chose not to include any intermediate coaches but later converted some of its own to run with them. Following the merger with the BT, the units were renumbered to 566 077-080. The units have changed in their use and the power cars are now used at each end of six-coach 'Voralpen Express' rakes, a duty for which they have been further renumbered to 561 081-084 (although they should not be confused with the SBB class 561). The SOB has subsequently acquired one of the ex-MThB units, 561 174 - which has retained this number.

**Chemin de fer Pont Brassus (PBr)** is an oddity in that its trains were always operated by SBB and it owned no locomotives. The two NPZ units built by the SBB for them in 1989 (2184-5) operated in SBB livery but with a couple of small PBr logos attached. Following the PBr's amalgamation into Travys in 2001 they are now clearly liveried for their new owners. The two units have received the 'Domino' refurbishment and are now numbered 568 384/5.

**Mittel Thurgau Bahn (MThB)** ordered four new units in 1994. These were 566 631-634, but with six driving trailers. These were transferred to Turbo when the MThB failed, and then sold to the SBB in 2006 where they were renumbered 561 171-174. Excepting 561 174 which went to SOB, the other three have been withdrawn. Two of the driving trailers have been passed to the SZU in Zürich.

**Montafonerbahn (MBS)** runs from Bludenz

Region Alps 'Domino' set RA04 with driving trailer ABt 39-43 944 leading at Monthey on 26 October 2017. The RA sets can be distinguished by the red window band along the side.





to Schruns in the Vorarlberg Province of Austria. It operates four two-piece NPZ sets. Two sets, ET10.107-108 (plus driving trailers ES10.207-208) were built new in 1990 and 1993, then it acquired two of the prototype sets (560 001 – ET10.122+ ES10.222 and 560 003 – ET10.121+ES10.221).

**Chemin de Fer de Jura (CJ)** bought one of the prototype units, 560 002, in 2008 which is now numbered 560141.

**Oensingen Balsthal Bahn (OeBB)** took on the first of the prototype units, 560 000, in 2008 which is now numbered RBDe4/4 207.


**Conclusion** – The ‘Domino’ rebuilding project should ensure a further fifteen years of regular operation from these units, providing second rank services which are important to the Swiss, and which continue with very little fuss or publicity.

*\*Note, I have also seen Neue and Neues used in this context.*

#### Sources:

[https://en.wikipedia.org/wiki/SBB-CFF-FFS\\_RBDe\\_560](https://en.wikipedia.org/wiki/SBB-CFF-FFS_RBDe_560).

● *Schweizer Eisenbahn-Revue* (various editions, including 4/1984 describing the prototypes, 4/1992 describing the intermediate coaches and 7/2009 for description of Domino programme).

● *Swiss Railway Motive Power* by Martin Fisher, published by SRS. 



1. SBB ‘Domino’ unidentified driving trailer at Ligerz on 27 October 2017. Note the MU cable fitted to units without automatic couplers.

2. SBB NPZ with unidentified driving trailer at the rear on a west-bound train east of Grandvaux on 2nd July 2009.

3. SBB NPZ RBDe 561000 configured for use on the Basel S-Bahn route into Germany, but seen in Wohlen on 7 September 2011 having been replaced by Flirt units.

4. SBB Prototype NPZ driving trailer Bt 29-34 903 departing Basel SBB on a shuttle service to the exhibition site for ‘Basel SBB 125’ in October 1985. Two of the four units had the then new all red front end.

