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Joint press release from Siemens and SWM/MVG

## **Siemens presents the first carbody for Munich's new metro trains**

**In a ceremony in its Vienna plant, the Siemens Rail Systems Division has presented to the Munich City Utilities (SWM) the first painted carbody of the new metro trains ordered for the Munich transit company MVG. It is the end section of the first of 21 C2 type six-car permanently coupled trains, which the SWM/MVG ordered from Siemens at the end of 2010. This was the largest order for rolling stock in the history of the Munich Underground. The investment totals about 185 million euros. At the same time, SWM/MVG took out two options on a further 23 metro trains, for a total of 276 cars, which can be transformed into firm orders until 2016 and 2020, respectively. This would increase the total investment to around 550 million euros. The new trains are being built in the Siemens plants in Vienna, Austria, and in Munich-Allach, Germany. From the seventh train onward, final assembly will take place in Munich.**

These new metro trains are largely based on the well-known C car design used for the previous generation of vehicles, which was developed by Alexander Neumeister, the internationally renowned Munich vehicle designer. Further development of the proven vehicle design has made the new C2 type trains even more customer-friendly, economical and ecological than the C1 type. A great deal has been adopted from the latest development in metro vehicles, which is marketed by Siemens under the name Inspiro. Assuming certification procedures will be finished on time, the first four of the new metro train units are due to enter passenger service with the start of the winter timetable in mid-December 2013. SWM/MVG has applied for financial assistance from the Free State of Bavaria.

The highlights of the new C train include not only its high passenger capacity, acceleration rate and availability, but also its end-to-end accessibility (i.e. it is a permanently coupled train without any

self-contained cars), its interior layout and wide passenger doors. Remarkably, the train is also more than 95 percent recyclable and especially energy-efficient thanks to the recovery of up to 50 percent of the braking energy. The design is based on the well-known appearance of the C car of the previous generation of vehicles, which was developed by Alexander Neumeister, the internationally renowned Munich vehicle designer.

The following changes are planned for the C2 in comparison with the first generation C train (series C1.9 and C1.10 with a total of 18 trains and 108 cars):

- Ever better passenger interchange and higher capacity due to enlarged standing areas in the gangways between the car sections, thus also creating more space for baby carriages and wheelchairs
- Improved indication of the door opening and closing sequences by means of colored LED light strips in the door edges: inside above the double-leaf doors and outside between the door leaves and rubber lips of each double-leaf door.
- A slightly modified front section with new lighting equipment based on LED technology to create a sleeker appearance.
- Redesigned interior lighting using low-maintenance, energy-efficient LED lamps instead of the previous halogen spotlights to produce more even and pleasant illumination.
- All seats are padded. Wooden seats have been eliminated because ten years experience has shown that wooden seats damaged by vandals are more expensive to repair.
- Optimized technology reduces power consumption, maintenance costs, and improves diagnostic capabilities so that faults can be rectified more quickly.
- The systems used also require very little maintenance, which lengthens maintenance intervals and increases the availability of the metro fleet.
- Higher maximum speed: 90 km/h instead of the previous 80 km/h
- Factory-equipped with CCTV surveillance cameras, passenger TV and fire protection measures (sprinklers)
- Pre-equipped for driverless operation (i.e. driver's cab can be eliminated or greatly reduced to increase capacity even further)

### **Even more space for passengers**

Changes in the seating arrangement have created more space for additional passengers. The C2 train will accommodate a total of 940 passengers instead of the previous 912. It will have 220 seats and standing room for 720 passengers, thus increasing the total capacity by 28. That corresponds to three percent more space in comparison to the previous C train. The new C model can also

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carry eight percent more passengers than the even older vehicles in the MVG fleet. This is a crucial factor for ensuring fast passenger interchanges at the station platform, especially in view of increasing ridership. The basic seating concept remains unchanged, with some seats arranged longitudinally and some arranged face-to-face. This satisfies not only the various customer preferences but also the international standard for metro vehicles.

#### Technical data of the C2 metro for Munich

Train configuration	MC+M+M+M+M+MC
Wheel arrangement	Bo'Bo'+Bo'Bo'+Bo'Bo'+Bo'Bo'+Bo'Bo'+Bo'Bo'
Carbody material	Aluminum
Track gauge	1,435 mm
Length over couplers	approx.115,000 mm
Width of car	2,900 mm
Height of floor above top of rail	1,100 mm above TOR
Wheel diameter max. / min.	850 / 770 mm
Maximum axle load	13.5 metric tons
Seats	220
Train capacity at 4 pass./m <sup>2</sup>	940
Passenger doors per car	6
Minimum track radius Main track/depot	270 m/70 m
Maximum negotiable gradient	5%
Maximum speed	90 km/h
Maximum starting acceleration	1.3 m/s <sup>2</sup>
Mean braking deceleration	1.2 m/s <sup>2</sup>
Line voltage	750 V DC/third rail

The 21 trains ordered are scheduled to be delivered between 2013 and 2015. Some of the trains are intended as replacements, some as additions to the fleet. Fourteen trains will replace old rolling stock which is to be scrapped after more than 40 years in service. Keeping them in service beyond 2013 and 2015 would be uneconomical in view of dramatically rising maintenance costs. On top of that, after 40 years, an increasing number of spare parts are

simply no longer available. Seven trains will be needed for the first phase of the 2010-2020 MVG service campaign. This calls for trains to run at two-minute headways over downtown line sections as of 2014. Up till now, the minimum service interval has been 2.5 minutes. If ordered, the rolling stock covered by the option could be delivered as of 2017-2018 to replace other obsolescent vehicles and provide more frequent service. About 60 percent of the city's metro fleet is scheduled for replacement by 2025.

You will find more detailed information and photographs in our Internet Special at:

<http://www.siemens.com/presse/c2>

The **Siemens Infrastructure & Cities Sector** (Munich, Germany), with approximately 87,000 employees, offers sustainable technologies for metropolitan areas and their infrastructures. Its offerings include integrated mobility solutions, building and security technology, power distribution, smart grid applications, and low- and medium-voltage products. The Sector comprises the Divisions Rail Systems, Mobility and Logistics, Low and Medium Voltage, Smart Grid and Building Technologies. For more information, visit:

<http://www.siemens.com/infrastructure-cities>

The **Siemens Rail Systems Division** (Berlin, Germany) is a leading international provider of rail vehicles and related services. The portfolio comprises the entire spectrum of rolling stock – from trains, metros and locomotives to trams and light rail systems. To this end, the Division smoothly combines its expertise in the fields of mass transit, mainline and logistics transportation in order to offer comprehensive know-how for eco-friendly, efficient and reliable rail vehicles that are already in revenue service in more than 40 countries worldwide. Further information is available at:

<http://www.siemens.com/rail-systems>

With over a million private and business customers, **Stadtwerke München (SWM)** – Munich City Utilities – are one of the largest power and infrastructure companies in Germany. SWM stand for reliable and resource-conserving energy generation, for the supply of fresh drinking water, and for some of the most modern aquatic centers nationwide with 18 indoor and outdoor swimming pools. Through their subsidiary MVG, the utilities provide environmentally friendly mobility. SWM also serves as a role model with their Renewable Energies expansion campaign, commitment to district heating and city-wide expansion of the fiber-optic network. For more information, visit: <http://www.swm.de>

The **Münchner Verkehrsgesellschaft (MVG)** is a subsidiary of **Stadtwerke München (SWM)**. It is responsible for providing the underground, bus and light rail services in the Bavarian capital that transport more than 520 million people every year. The current transportation network covers 628 kilometers and almost 1,200 stops, which are served by a total of 84 lines. It forms the backbone of the Munich public transportation system. Further information is available at:

<http://www.mvg-mobil.de>

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