

Munich, June 13, 2018

InnoTrans 2018, September 18-21, 2018, Messe Berlin, Hall 4.2

Siemens highlights connected mobility at the InnoTrans 2018

- **Motto of the company's show: "Shaping connected mobility"**
- **Fair highlights: Digital Station, Interlocking in the Cloud and new Velaro Novo high-speed train with 30 percent lower energy consumption**
- **Digital solutions make infrastructures intelligent, improve passenger experience, guarantee availability and increase sustainability over the entire lifecycle**

Under the motto "Shaping connected mobility" at the InnoTrans, Siemens is presenting digital innovations in an increasingly networked "total mobility system." The solutions will make rail transport even more efficient, safer and reliable.

Digitalization is fundamentally transforming the mobility industry: It is improving the availability of vehicles and infrastructures, optimizing operations and reducing complexity, efforts and costs. It is providing travelers attractive and seamless mobility from A to B, and is helping rail operators make their infrastructures intelligent, improve passenger experience, guarantee availability and increase sustainability over the entire lifecycle of their investments.

MindConnect Rail – secure data transmissions from safety-critical infrastructures

MindConnect Rail is a modular and flexible software and hardware solution for ensuring secure data transmissions from safety-critical infrastructures. MindConnect Rail utilizes all functions of the new Data Capture Unit (DCU) in order to provide full and secure access to data as well as guarantee cyber security. The MindConnect Rail solution from Siemens is a central component of the intelligent transport infrastructure needed for the digital integration of rail and road transport and

tomorrow's networked "total mobility system."

MindSphere, the IoT operating system from Siemens, enables new digital solutions for the rail industry through comprehensive data management

Each train generates large amounts of data that provides information on the train's condition and functionality of its components and systems. The same is true for rail infrastructures. Siemens' open IoT operating system MindSphere uses artificial intelligence to comprehensively manage this data, making possible completely new solutions for the rail industry.

Railigent, the open digital ecosystem is now providing 3rd-party applications

The Railigent application suite from Siemens enables operators to intelligently use rail data, optimize their maintenance and operations, and guarantee hundred-percent availability. Railigent is based on MindSphere, the IoT operating system from Siemens. In the past, Railigent could primarily be used to analyze Siemens systems. With its cooperations with partner companies and the integration of partner applications, Siemens can now provide customers with comprehensive asset management of their vehicle fleets and rail infrastructures. Siemens has already integrated applications of three partner companies: SKF GmbH, Strukton Rail b.v. and Voith GmbH & Co. KGaA. All of these companies have specialized competencies for the digitalized condition monitoring of vehicle components and rail infrastructures. On the basis of measurement data supplied by these applications, the maintenance of rail systems can be optimized and made more cost-efficient. The benefits include, for example, reduced lifecycle costs, extended service and maintenance intervals, and prevention of accidents or unplanned service downtimes.

New cloud-based solutions reduce the need for hardware installations

The "interlocking in the cloud" will revolutionize long-distance rail transport. With this system, interlockings as well as operator control logic can in the future be centralized at one location, free of spatial limitations. This will give operators unprecedented flexibility and generate cost savings for their infrastructure and operations – naturally without any compromises in safety and security. Siemens is already working with partners on implementing this advanced technology.

Digital Station – interaction between integrated mobility offerings

Railway stations are vital hubs for intermodal urban transport. Only by ensuring that transfers between various transport modes are reliable, seamless, convenient and time-saving, will growing numbers of people use the most efficient and eco-friendly transport mode – public transport systems. Siemens' Digital Station solutions cover a broad spectrum of functions, ranging from infrastructure management and universal intermodal travel information to data analytics needed to continuously optimize operations. This helps operators achieve 100-percent availability, increases passenger throughput and improves travel comfort – important prerequisites for providing attractive public transport.

Digital twin provides full transparency for rail infrastructure projects

In cooperation with software partners like Bentley Systems, Siemens is using "Building Information Modeling" – a digital twin for the planning, design and construction of complex rail infrastructure projects. This computer-generated model provides an object-oriented, parametric and digital 3D depiction of the planned system. The database provides the prerequisites for extensive simulations that ensure system conflicts are avoided, risks of delays are reduced, and project implementation can be expedited.

Siemens is presenting another innovation in the sector of rail electrification at the InnoTrans: For the first time, the company can depict a rail system's electrical network and energy flows in a data-based real-time simulation. This functions by combining the SCADA network control system (Sitras RSC) with the intelligent energy management system Sitras iEMS together with Sitras Sidytrac Real Time. This enables peak loads to be predicted and avoided, makes critical network conditions transparent, enables train timetables to be optimized by energy demand and consumption, and ultimately reduces energy consumption by up to 15 percent.

Modular vehicle platform meets growing demands for flexibility, lower lifecycle costs and improved comfort

The new Velaro Novo from Siemens is a systematic further development of the three preceding generations of Velaros. Numerous innovations in details make the new high-speed train a unique, highly efficient concept that consumes 30 percent less energy and substantially reduces investment and maintenance costs while at the same time providing a ten-percent increase in capacity. With its empty tube

concept and numerous configuration possibilities, the Velaro Novo is future-proof and can be flexibly adapted to meet new design concepts and operator needs even after years in operation.

This year, Siemens is again showcasing its products and solutions in Hall 4.2 and in the outdoor exhibition area. In addition to the highlights mentioned above, the company will also be showing the following vehicles outside:

- **Avenio M Ulm:** For its new Line 2, SWU Verkehr GmbH, a subsidiary of the municipal utility in Ulm, Germany, has ordered twelve Avenio M articulated trams that have been optimized for the Ulm tram routes with their steep grades. The Avenio M sets standards for safety: The “Siemens Tram Assistant” collision warning system helps the driver avoid accidents.
- **Metro Sofia:** Siemens is supplying the new metro Line 3 in Sofia, Bulgaria, with 20 Inspiro metro trains equipped with energy management and a train control system for automated operation including automatic platform doors.
- **Cityval Rennes B:** 25 Cityval Automated People Mover systems (APM) will begin operating on the second metro Line B in Rennes, France, as of 2020.
- **Rhine-Ruhr Express (RRX):** With its innovative design and digital networking, the RRX sets new standards for passenger comfort and convenience and operating availability in Germany’s most heavily populated Rhine and Ruhr region. The first of a total of 82 Desiro HC electric multiple-unit trains will be delivered starting at the end of 2018.
- **Desiro City Moorgate:** The Desiro City is the successful platform offering maximum flexibility, perfect passenger comfort and convenience, and low energy consumption for the British market. The trains being built for customer Govia Thameslink Railway (GTR) are the third order for this train platform. The first of the 25 ordered trains will begin service on London’s Great Northern Line beginning late in 2018.
- **Desiro ML ÖBB cityjet prototype for battery operation:** Alternative drive systems are becoming increasingly important for operations on non-electrified rail routes. Working together with customer Austrian Federal Railways (ÖBB), a series-production Desiro ML ÖBB cityjet was equipped with a battery for operating without an overhead power line.
- **Vectron MS:** The Vectron is the universal locomotive for Europe; the multiple-system version enables it to provide cross-border freight and

passenger service throughout Europe. The exhibited ÖBB Vectron can be operated in nine countries and also used in multiple-unit operation with other ÖBB locomotives, enabling it to be flexibly integrated into the customer's existing fleet.

- **Smartron:** The Smartron, the new locomotive from Siemens, is tailored to a specifically defined transport task and combines the advantages of a standard product with the proven platform technology of the Vectron. The Smartron was conceived as a preconfigured locomotive for freight transport in Germany and offers customers cost-efficient operation with high operational safety.

The Mobility Division will be a fully owned subsidiary of Siemens AG as of August 1, 2018 and be named Siemens Mobility GmbH. The mobility arm of Siemens has been a leader in developing transportation solutions for over 160 years. The unit's portfolio includes innovations in the segments of rolling stock, rail automation, traffic management systems and rail electrification. In fiscal 2017, which ended on September 30, 2017, Siemens' Mobility business posted revenue of €8,1 billion. At the end of September 2017, the Division had around 28,405 employees worldwide.

This press release and additional material are available at:

www.siemens.com/press/innotrans2018

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Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for 170 years. The company is active around the globe, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is a leading supplier of efficient power generation and power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. With its publicly listed subsidiary Siemens Healthineers AG, the company is also a leading provider of medical imaging equipment – such as computed tomography and magnetic resonance imaging systems – and a leader in laboratory diagnostics as well as clinical IT. In fiscal 2017, which ended on September 30, 2017, Siemens generated revenue of €83.0 billion and net income of €6.2 billion. At the end of September 2017, the company had around 377,000 employees worldwide. Further information is available on the Internet at www.siemens.com.