

Participating in the “9th UIC World Congress on High Speed Rail”

RTRI personnel attended the “9th UIC World Congress on High Speed Rail” that was held at the Tokyo International Forum between July 7 and July 10, 2015. Including the keynote speech by Norimichi KUMAGAI (President, RTRI) in the opening session, six presentations were delivered by RTRI. President KUMAGAI's speech was titled “Creating New Values of Railway by Shinkansen Technology.” He reviewed the contribution of Japanese Shinkansen to the creation of new values of railways from the aspects of safety, reliability, environmental adaptability, and high-speed operation. These innovations have positively impacted society and the economics of Japan. He also commented on other technical improvements required for further speed-up and added-value of Shinkansen operations in the future. In Executive Director OKUMURA's speech, “Vehicle Running Safety on Railway Structure during Earthquake”, he introduced a fundamental design and its concept to specifically ensure the safety of railways during

earthquakes through analyses on causes and mechanisms of actual derailments. RTRI also opened an exhibition booth at the Congress for the participants to showcase its efforts to develop Shinkansen technologies in the past, present, and future.



Dr. KUMAGAI (President, RTRI) during speech

Superconducting Flywheel Power Storage Demonstration System

RTRI has been developing a superconducting flywheel power storage system, as a next-generation large power storage system. The flywheel power storage system is capable of storing electricity in the form of kinetic energy by rotating a large disk (flywheel) and converting the rotating power again to electricity as required. Typically, in combination with less reliable power-generation systems such as solar photovoltaic or wind-power generation, it can help stabilize power supplies. It is also applicable to electrical railways in order to prevent regenerative cancellation. Since the superconducting flywheel power storage system developed by RTRI is levitated without contact by a “superconducting magnetic bearing” composed of a high-temperature superconducting coil and high-temperature superconducting bulk, the power loss is minimal even though a large flywheel is used. It is a very practical system that permits stable power generation over a long period. The completed demonstration unit has 300-kW output capability and 100-kWh storage capacity. It is equipped

with a built-in carbon fiber reinforced plastics (CFRP) flywheel (2 m in diameter and weighing 4 tons), which is levitated with a superconducting magnetic bearing (SMB) at a maximum speed of 6,000 rpm. The SMB that consisted of a superconducting material bulk and a superconducting magnet is the world's first. Despite small in size, the SMB is capable of supporting a heavy weight.

This system has been developed by RTRI jointly with Kubotek Corporation, Furukawa Electric Co., Ltd., Mirapro Co., Ltd., and the Public Enterprise Bureau of Yamanashi Prefecture, in a project known as “the Technical Development for Safe, Low-Cost, Large-Capacity Power Storage System - the Development of the Next-Generation Flywheel Power Storage System” sponsored by the New Energy and Industrial Technology Development Organization (NEDO).



The Flywheel Power Storage Demonstration System

Research Workshop on Railway Operations at RTRI

On July 31, a research workshop on railway operations modeling, analysis and simulation was held at RTRI with a total of 40 participants.

The workshop began with a welcome by Dr. Ikuo Watanabe, Executive Director. In addition to six lectures on simulation, timetable stability, rescheduling and some other subjects, a 40 minute plenary session was held to discuss topics including evaluation of timetable and rescheduling from the viewpoint of passengers with accumulated data. The six lecturers were Ms. Yoko Takeuchi (RTRI), Mr. Hajime Ochiai (JR-West), Dr. Yung-Cheng Lai (National Taiwan University), Mr. Hideyuki Yabuki (Tokyo Metro), Dr. Francesco Corman (Delft University of Technology) and Mr. Keisuke Sato (RTRI), listed in the order of presentation.

After closing the discussion, the participants were guided through the research facilities on the premises of RTRI, and invited to a welcome reception to become better acquainted with one another.

Taking the advantage of the opportunity of the workshop this time, we look forward to further extend the areas of research activities of the Transport Operation Systems Research Group, which is responsible for the railway operations research at RTRI.



Discussion at the research workshop