

## Manufacturing Milestone: 2,000 Rail Cars Produced at US Plant

Earlier this year, Kawasaki announced that group company Kawasaki Motors Manufacturing Corp., U.S.A. (KMM), based in Lincoln, Nebraska, had achieved the manufacturing milestone of 2,000 rail cars. To celebrate the milestone, a commemorative event was held on February 1. The 2,000th rail car was a 7000-series subway car built for the Washington Metropolitan Area Transit Authority.

KMM's Lincoln plant began operations in 2001, as the Kawasaki Group's second rail car manufacturing plant in the United States, and the facility's integrated production system handles everything from car body production to final assembly. Lincoln reached a cumulative manufacturing total of 1,000 rail cars in February 2010, and in December of the same year, KMM expanded the production line, added testing facilities and made other upgrades to the plant.

In recent years, the Lincoln plant has produced subway trains for the Metropolitan Transportation Authority, commuter trains for Metro-North Railroad, and otherwise responded to strong American market demand in this field. Furthermore, KMM is focused on locally-based manufacturing, intentionally procuring U.S.-produced parts, thus contributing to an increase in local

employment. These cars are highly rated by our clients for their superior quality, and meet all "Buy America" requirements. Kawasaki is pursuing renewal projects for existing rolling stock, transport capacity enhancement plans, and other such endeavors in the United States, with a primary focus on the Northeast Corridor, and even greater demand for rail car production is expected in the future.



## New Plant for the Boeing 777X

The completion of a new plant at Nagoya Works 1 to produce fuselages for the 777X, Boeing's cutting-edge, large passenger airplane was recently announced. Kawasaki held a ceremony on February 1, to commemorate the plant's completion.

Construction of this new facility commenced in September 2015, on the grounds of the North Plant of Nagoya Works 1. Kawasaki is responsible for manufacturing the forward

fuselage, center fuselage, main landing gear wheel well, aft pressure bulkhead, and cargo door sections of the 777X, and the new plant will be used for forward and center fuselage panel assembly. Full-out production equipment installation work was started in February, with the aim of beginning actual production operations in June.

The new plant further advances facility automation through the introduction of newly

developed equipment utilizing the latest in image sensing technologies and control technologies, which were developed with the entire Company working as a unified team. The new equipment includes Kawasaki-made robots capable of automatically detecting bore points and carrying out boring operations, auto riveters with an expanded operating range, and other such equipment. Moreover, the assembly lines will incorporate the Kawasaki Production System\* to achieve high-quality, high-efficiency production operations. Kawasaki will also proceed with the improvement of facility infrastructure, including ICT, IoT (Internet of Things), and other technologies, with the goal of transforming it into a smart factory.

\* Kawasaki Production System (KPS): Based on the Just-In-Time system, the KPS uses Kawasaki's proprietary logical production management techniques, which were developed and proved effective in-house by being applied to production lines. The system can be implemented in any production line, regardless of whether it is a mass-production or made-to-order production line.



## 100th Unit of CH-47J/JA Transport Helicopter Delivered

In January, Kawasaki announced that they had delivered the 100th unit of the CH-47J/CH-47JA transport helicopter to the 1st Helicopter Brigade of the Japan Ground Self-Defense Force (JGSDF). Kawasaki produces the helicopter for the JGSDF and the Japan Air Self-Defense Force (JASDF).

Introduced by the JGSDF to replace the older V-107 transport models, the CH-47J/JA is a tandem rotor helicopter with rotor blades in both the Forward and Aft. This model has a large ramp door in the Aft Section to facilitate easy loading/unloading of cargo and so forth, and it performs excellent maneuverability and

stability. The CH-47J/JA is used for disaster relief, personnel transport, international missions and a wide range of other operations.

Kawasaki launched the production of the CH-47J under the license from the Boeing Company in the United States in 1984. Since FY 1986, Kawasaki has delivered a total of 69 units of both the CH-47J and the CH-47JA (an upgraded version of the CH-47J equipped with a larger fuel tank to enable greater flight range) to the

JGSDF. Between FY 1986 and FY 2012, the company also delivered 31 units to the JASDF.



## Cells Cultured by Automation Used for Groundbreaking Clinical Study

Kawasaki announced recently that the Faculty of Medicine of Chulalongkorn University (MDCU) in Thailand had performed a cell therapy of knee cartilage using mesenchymal stem cells cultured by AUTO CULTURE\*, an automated cell processing system developed by Kawasaki. Kawasaki and MDCU have been collaborating in a joint research project to automate the process of culturing mesenchymal stem cells using AUTO CULTURE. This is the world's first clinical study using cells cultured by robot automation.

Kawasaki participated in a regenerative and cell medicine project jointly promoted by the New Energy and Industrial Technology Development Organization (NEDO) in Japan and the Ministry of Commerce of Thailand (2011-2013)\*\* and has installed AUTO CULTURE at MDCU. Under a collaborative research agreement, Kawasaki and MDCU have been conducting demonstration experiments aimed at automated culturing of human cells and their use in actual therapy, and MDCU has now performed a cell therapy based on the "articular cartilage deficiency restoration method using autologous mesenchymal stem cells" developed by Dr. Shigeyuki Wakitani, a professor at Mukogawa Women's University in Japan. MDCU will continue the clinical study using cells cultured by AUTO CULTURE, with the aim of raising the

level of medical technology and welfare in Thailand through the verification of therapeutic results.

AUTO CULTURE has succeeded in automating the process of culturing high-quality cells using advanced robotics technologies. In clinical applications of regenerative medicine, cells are collected from the patient, increased by culturing, processed as necessary, then transplanted to the affected area. Since cell culturing and processing facilities (CPFs), where cells for clinical application are cultured, assume that the culturing will be done manually, the processing rooms must be maintained at a very high level of cleanliness, and highly

skilled culturing technicians are required. These requirements make it extremely expensive to construct and maintain CPFs, with the added burden of having to train technicians. These obstacles are impeding the widespread use of regenerative medicine. AUTO CULTURE resolves these issues through robotic culturing inside a system maintained at an extremely high level of cleanliness, thus contributing to the safe and low-cost clinical application of regenerative medicine.

Based on technologies cultivated through this project in Thailand, Kawasaki is currently developing a more efficient version of AUTO CULTURE, which is scheduled to be launched in a few years.



\* AUTO CULTURE: Registered trademark of Kawasaki

\*\* Regenerative and cell medicine project: An international research, development, and demonstration project in environmental and medical fields; international research and development on advanced medical equipment systems and their demonstration; and research and development on regenerative and cell medicine technologies and optimization of manufacturing infrastructures.