Reviving Niitsu

Niitsu is in the center of the Kanbara Plain, one of the major granaries in the northeastern part of Niigata Prefecture facing the Sea of Japan. The first railway ran through Niitsu in 1897. As a traffic hub, Niitsu had a workshop and depots. Just before World War II, more than 10,000 railway people worked in the area. Eventually, Niitsu became known throughout Japan as a "railway town." However, with the post-war arrival of motorization, the railways in Japan were rationalized. As a result, the workshop and depots in Niitsu were reduced significantly and by the early 1970s, the town had fallen into decline.

To reverse the decline, the Niitsu Rolling Stock Manufacturing Factory was built in 1994 with an investment of ¥18 billion on the 150,000-m^2 site of the former workshop southwest of Niitsu Station. This is the only factory in Japan where a railway company manufactures rolling stock for itself. For half a century, since the National Railways built steam locomotives during the war, none of the railway companies has manufactured its own rolling stock.

For railway engineers who had devoted themselves to inspecting and repairing rolling stock, having their own factory was like a dream. Shigeyuki Hayashi was one of the engineers promoting the project from the beginning. He is now manager of production control at the new Niitsu Factory. He had been engaged in modernization of workshops in Indonesia, India, and Sri Lanka. In 1989, Mr Hayashi received an order from management to study a plan for construction of a new rolling stock manufacturing factory. Although he is an expert in inspection and repair of rolling stock, he had no experience in manufacturing cars. He studied hard to find ways to assess the plant area, types and numbers of machines, and investment required. He even visited rolling stock manufacturers. After a careful feasibility study, he reported that the project was a good investment.

Niitsu Rolling Stock Manufacturing Factory *(JR East)*

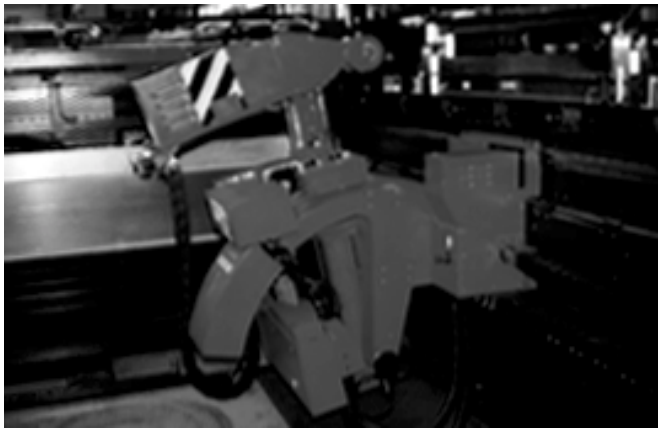
For a railway company, manufacturing rolling stock for itself has a number of merits. Since the costs can be clearly understood and strictly controlled, it is possible to estimate future cost reductions. One can also determine the main points in predicting the economic as well as physical life of rolling stock. In addition, it is possible to predict what next-generation cars should be like and maximize efficient use of available resources, such as land, buildings, manpower, and technology. Both Mr Hayashi and the top management felt confident that they would be able to enjoy these merits. Mr Hayashi still remembers the days when he was absorbed in his efforts towards making the dream a reality.

At first, factory superintendent Yoshio Kinugasa, who had been the project leader since factory construction started, felt uneasy about building rolling stock independently. However, at the same time, he was buoyant with expectation. His father had been a rolling stock engineer too. Mr Kinugasa felt strongly that his father would have been delighted to know his son was going to meet the big challenge in the same field.

The dream of the JR East engineers came true in July 1992. Construction of Niitsu Rolling Stock Manufacturing Factory started on the site of the former JNR Niitsu plant and the new factory began operating in October 1994.

The 209 series stainless-steel commuter trainsets used in Metropolitan Tokyo are manufactured at the new factory. The 209 series was developed by JR East as a futuristic car designed with emphasis on "... halving the life, weight, and cost." It has space for wheelchairs and additional grip bars and hand straps for the convenience of passengers. The series is also environment-friendly because it uses less electricity and produces less noise. The first trainset was finally completed in the spring of 1995. Mr Kinugasa says, "Everyone has been endeavouring to learn car manufacturing since the factory started operation. All the 400 workers had shining eyes when the first trainset rolled out onto the main track for testing. We all felt the joy of building things."

At the Niitsu factory, all the car bodies and bogies are manufactured from basic components. The assembly lines are arranged for efficiency to turn out one car a day. The factory uses computer-controlled equipment to save labor in processing, assembly, and bogey fabrication. The entire production line is controlled by CAD/CAM systems.



"Sasuke-kun" Press Brake Robot at Work *(EJRCF)*

Mr Iwasaki *(EJRCF)*

Everyone visiting the factory is surprised by the array of 40 robots that are capable of unattended operation during the night for as many as 400 hours a month. The first welding robot introduced to the factory was nicknamed "Makura-kun." The nameplate on its side reads: "My good point is exceptional industriousness; my shortcoming is lack of flexibility. I weigh 300 kg and am 2.4-m tall." The other robots include the stretch former for bending roof frames on a curved plane; the handling robot for spot working small items; the five-faced automaton for cutting and drilling bogie frames from five sides-top, front left, front right, rear right, and rear left-while using various tools in turn; and the arc welding robot for bogie frames. In fact, there is hardly a human in sight.

Mr Hayashi (Left) and Mr Kinugasa *(EJRCF)*

However, for the robots to work efficiently there must be human intervention. Yoshio Iwasaki, operator of the press brake robot for pressing external reinforcements, calls his machine "Sasuke" and takes good care of it even putting a flower in the robot's arm. He invented an ingenious device to prevent mis-positioning of the material fed to the press and dramatically improved the robot's operation rate. He won a number of prizes, including the 1996 Award from the Director-General of the Science and Technology Agency. He says, "Machines and robots are hard workers, but we must look after them, remembering their shortcomings and attending to their problems. By doing so, they can work harder." Mr Iwasaki suggests more than 200 new ideas each year to further improve the robot's efficiency. He says his aim is to become a processing expert.

Since 1995, the factory has been accepting local students and foreign visitors in the railways field. So far, some 3,500 people have visited. Mr Hayashi says cheerfully, "In the days when the Niitsu workshop was dedicated to inspection and repair, we had few visitors from the head office, let alone from foreign countries. It's like a dream. We would like to make the factory world famous."

By June 1996, one hundred and sixty 209 series cars (16 trainsets) had been manufactured. They serve as commuter trains in Tokyo along with 380 cars of the same series manufactured by private companies. The factory has formed 12 project teams to establish a production system with a capacity of 200 units a year by this autumn. Possibly, JR East is the only railway company in the industrialized world manufacturing its own cars.

The birth of the Niitsu factory owes much to the late Isamu Yamashita, ex-president and chairman of Mitsui Engineering & Shipbuilding Co., Ltd. and the first president of JR East. Originally a shipbuilding engineer, he believed that JR East should have its own rolling stock manufacturing factory. He thought that since Japanese railways have been privatized and various regulations removed, it is important to foster engineers who know the joy of building things. In addition, he believed that JR East should offer rolling stock and related services to meet the needs of customers.

A stone monument standing in front of the factory reads "jikei-fushi" meaning lifelong self-enlightenment. Standing in front of the monument, Mr Kinugasa says, "We have just started. The first thing to do is develop the power to create and improve. Then, we would like to reinforce our ability to develop and design new products." The leading players at the Niitsu factory who have experienced the joy of building are still advancing toward their goal.