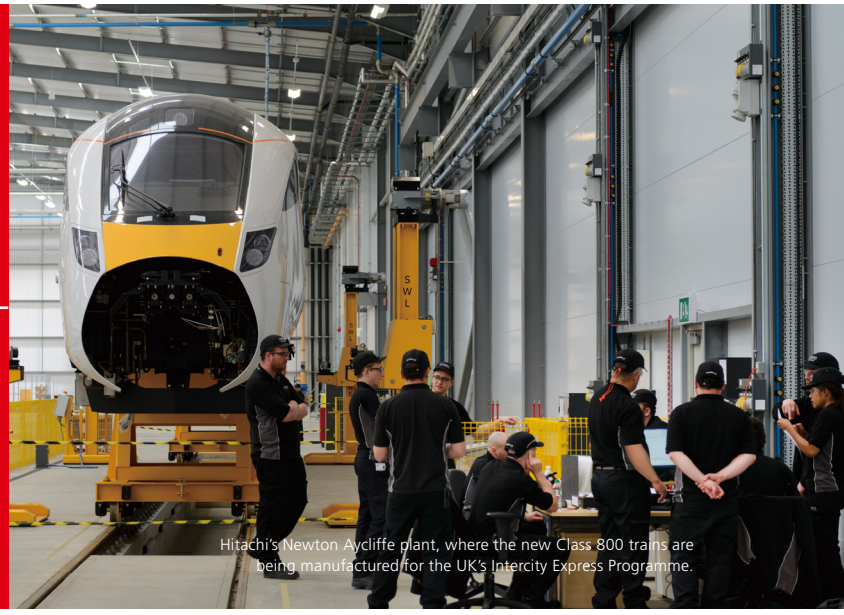
CREATING VALUE FOR SOCIETY THROUGH RAILWAYS

Interest is rising in railway infrastructure as a way to deal with the social issues that accompany global warming and increasing urbanization. Hitachi is now expanding its global railway system business using the considerable technological expertise it has developed over many years.



Hitachi's Newton Aycliffe plant, where the new Class 800 trains are being manufactured for the UK's Intercity Express Programme.

Meeting the Railway Systems Needs of Today's Society

There is now great interest in role that railway systems can play in dealing with the various social issues caused by global warming and population growth. As the economies of developing nations rapidly grow, their populations concentrate in cities, causing serious problems like traffic congestion and air pollution and increasing the need for environmentally friendly railway transport. Meanwhile, existing transport infrastructure in developed nations has deteriorated and is in urgent need of renovation to meet current requirements.

Previously, Hitachi focused mainly on manufacturing rolling stock and electrical products, but in recent years it has expanded its business to provide a comprehensive range of services for running railways, such as operation management systems and maintenance services.

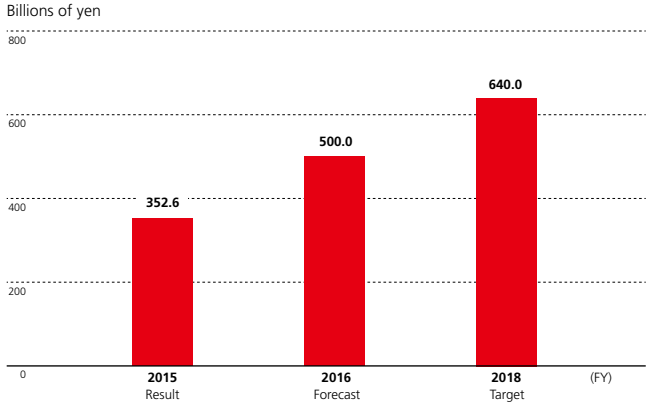
The European Rail Industry Association, UNIFE has estimated that the global railway-related market will grow from ¥13.2 trillion (2014–16) to ¥14.6 trillion (2017–19). We anticipate significant growth for the railway operations segment of our business. In 2015 Hitachi acquired two Italian companies—AnsaldoBreda, a rolling stock manufacturer, and Ansaldo STS, a transportation system technology company—thereby enhancing its signaling and railway operation businesses, as well as its turnkey solutions, with an expanded product portfolio.

A Global Company with Comprehensive Offerings

With the acquisition of the two Italian companies, Hitachi has become one of only a few players in the global railway industry that offers a full lineup including rolling stock and systems. As well as various achievements in the global market to date, most famously demonstrated by the Shinkansen bullet train, Hitachi has an industry-leading track record for safety in operation management systems and in rolling stock. Hitachi has placed particular emphasis on environmental considerations, reducing noise pollution and making increasing use of recycled materials, and is a market leader in bimodal and hybrid systems that switch between electric and diesel operation. Hitachi is also developing technology for using big data to improve the efficiency and safety of railway logistics.

Hitachi is using these strengths to focus not just on specific services—like rolling stock systems, signaling, and traffic management—but also a full range of turnkey railway-system solutions including transport systems and Operations and Maintenance (O&M). In fiscal 2014, O&M accounted for 1% of railway-related revenue, but Hitachi's aim is to increase O&M and turnkey combined to 24% of the ¥640 billion in revenue targeted for fiscal 2018.

Revenues for Railway System Business



Meeting Needs in the Birthplace of Railway

Much of the United Kingdom's rail infrastructure dates back to the nineteenth century. This infrastructure is now deteriorating and in urgent need of modernization. Meanwhile, the British Department for Transport is currently implementing the Intercity Express Programme (IEP), which will replace aged rolling stock on main lines. Hitachi is using the technology it has built up over the years to win further IEP orders.

In October 2004, Hitachi was chosen as preferred bidder, and in the following year received the order for 29 Class 395 trains, with a total of 174 carriages, to run on the 109-km high-speed link between London and the Channel Tunnel. The first trains entered service in 2009. The successful completion of this project around half a year ahead of schedule was a huge boost to Hitachi's business in the United Kingdom. In 2007, Hitachi established the Ashford Train Maintenance Centre in southeast England.

In July 2012, Hitachi officially signed a comprehensive contract with the U.K. Department of Transport, which was moving forward with the IEP, including maintenance services to be provided for 27.5 years, and began design work. In September 2015, Hitachi opened a train manufacturing and assembly plant in Newton Aycliffe, in northeast England's Durham County, to produce rolling stock for the IEP. The plant is only a few hundred meters from the historic Heighington Station on the Stockton and Darlington Railway, the first publicly operated steam train line in the world. The revival of railway manufacture in a place with such importance to the history of rail has produced great expectations in the United Kingdom.

To date, much of the U.K.'s railway traffic management has been done manually, but in July 2015, as part of a project by infrastructure management company Network Rail to introduce automatic systems and improve efficiency, Hitachi won an order to provide operation management systems for Thameslink, a main London commuter line that suffers particularly serious traffic congestion. Hitachi was highly appraised for its 40-plus years of expertise managing routes including commuter lines in the Tokyo area and the Shinkansen network.

Hitachi's Pioneering Spirit at Work in the United Kingdom

As part of the IEP, Hitachi received an order for 122 trains and 866 cars, of which 110 trains will be produced at the Newton Aycliffe plant. The 43,000 m^2 plant has a production capacity of 40 cars a month and, as the company's European manufacturing operation, plays an important role in the global strategy of Hitachi's railway system business. In 2016, it began production of the first three trains for the Great Western Main Line, ready to enter service in 2017. Hitachi also plans to manufacture rolling stock for the East Coast Main Line and for the Abellio ScotRail (ASR) project at the plant.

Manufacturing Plant Manager Darren Cumner says that Newton Aycliffe was chosen for its transport links, availability of skilled workers, heritage, local heavy industry, and presence of other Japanese companies in the area. The plant has introduced a state-of-the-art just-in-time (JIT) production system. As well as fitting the whole production line in a single building, it has been designed to allow rolling stock without production problems to overtake stock that needs extra attention. Thus, even if a problem occurs production can continue to move ahead steadily without any need to halt the line.

Meanwhile, at the new plant Hitachi places special emphasis on two things in particular: dedication to the spirit of craftsmanship and the training of staff with solid technical skills.

There has been much interest in the region regarding the local recruitment of staff. The plant received 16,000 job applications in 2015, far more than the number of jobs available. To date, the plant has hired 550 people, selecting them according to the Hitachi founding concepts of harmony, sincerity, and pioneering spirit and prioritizing values over technical skills. The plant expects to increase its staff to 730 by spring 2017.

The Newton Aycliffe plant uses cutting-edge production methods to build its trains.

Back to Basics: Hitachi Training at the Plant

Production Manager Lee Nockels, who is in charge of staff training at the plant, joined Hitachi in January 2015 after spending 28 years in the army, rising to the rank of major. He notes that, like himself, most of the locally recruited employees are not from the railway industry.

"Some people would see that as a negative," he says. "But I see it as a positive. We have got very little baggage and very few bad habits."

The training for the plant's production employees is an abbreviated version of that implemented at the Kasado Works training manufacturing plant in Yamaguchi Prefecture, Japan. The U.K. program takes a minimum of five weeks, both in the classroom and working on a real train, and covers the basic skills of piping, rigging, and wiring.

Many employees have existing technical skills but are strongly encouraged to go back to the basics. "I always tell people: don't forget what you have learned before, but don't be afraid to learn something new," says Nockels.

As well as running this basic training, the Newton Aycliffe plant is actively engaged in an exchange of technical skills with Kasado Works in Japan. As Hitachi strives to transfer skills to its U.K. operations, many of the plant's staff have visited Japan for training, and there are currently 20 staff from Japan working at the plant. Hitachi's policy is to expand such opportunities for skills transfer in the future.

The Newton Aycliffe plant, pictured here, carries out ongoing technology exchange with Hitachi's flagship Kasado Works in Japan.

Local Staff Who Trained at the Kasado Works

Andy Crowe
Manufacturing Specialist

Before joining Hitachi in August 2015, Andy Crowe spent 21 years fitting kitchens into camper vans. He now leads a team of five employees who install catering units into the trains. Soon after joining Hitachi, he traveled to Japan for 12 days of training at the Kasado Works. In addition to learning the procedures, he recorded photos and videos of them along with detailed descriptions. The aim was to produce detailed standard operating procedures (SOPs) to be used by staff back in the United Kingdom. Crowe says that he was particularly impressed by the accuracy of the work in Japan. "Door gaps have got to be a certain measurement, and sometimes you are working to a precision of 0.5 millimeter," he says. "It would be 3 or 4 millimeters for a camper van."

Andy Dick
Section Leader for the ASR Project

Andy Dick joined Hitachi in March 2015 and left for Japan after just 21 days. Much of the training at the Kasado Works focused on quality, he says, giving the example of a multicoil wire. The wire might have 1,000 strands or more; if a scratch were found on just one of those, the entire multicoil would be rejected. "It was unbelievable," he says. Dick spent three months in Japan and observed about 900 different operations. "It was a difficult job," he says, "but made easier by the way we were welcomed by the Kasado staff."

New Systems to Ensure Japanese Quality in the United Kingdom

In Japan, employees often build up experience at the same company over many years, learning many different processes and skills. But U.K. employees are much more likely to change jobs in search of promotion. It is also relatively rare for technical staff to hone their skills in a single factory, and staff from a variety of technical backgrounds tend to work together. In order to manufacture rolling stock in the United Kingdom with the same assurance of quality as in Japan, and to make that process easily comprehensible to U.K. staff, Hitachi is systemizing procedures and the technical skills of experienced employees in Japan and recording those skills in use. In this way, Hitachi aims to increase product quality even further.

For the IEP rolling stock alone, some 700 SOPs have been defined and recorded. At the Kasado Works in Japan, hundreds of hours of video and thousands of photos have been taken then turned into manuals that are easily understandable by employees in the United Kingdom. Staff in the manufacturing area at the Newton Aycliffe plant can consult them whenever they wish using tablets available throughout the plant.

Manufacturing Engineer Fumio Fujinaga was transferred to the Newton Aycliffe plant in August 2015. An expert in rolling stock manufacture, he honed his skills at the Kasado Works in Japan. While at Kasado, he was involved in the training of staff from the United Kingdom, and since his transfer he has also had responsibility for staff development in the U.K. facility. At times, he has faced challenges in the form of communication difficulties, differences in technical background, and contrasting cultural attitudes to work. Nevertheless, he says that the skills transfer successfully achieved to date is thanks to the "pride of local staff in train manufacture" and their "keenness to learn."

CSR Activities at the Newton Aycliffe Plant

Senior HR Advisor Jacquie Smith was one of the first people hired at the plant, where she has been deeply involved in its CSR activities.

An early and key CSR project for the plant, she says, was becoming a founding member of the South Durham University Technical College (UTC), together with the University of Sunderland and Gestamp Tallent Ltd. The UTC is located just a short walk from the Newton Aycliffe plant. Classes are due to start in September 2016 for students aged 14 to 19 specializing in manufacturing, technology, and engineering. While some students may eventually work for Hitachi, others will be employed by other companies in the business park or fill skill shortages in the wider northeast England region.

The plant is also working with the Durham Education Business Partnership to offer career education in schools. A number of staff members volunteer as "business ambassadors" visiting schools and explaining the plant's work.

The plant is also working hard to encourage as many job applications from local people as possible. As part of that, it is cooperating with a social rented accommodation company called Livin that helps its tenants find good quality employment. The plant has also helped run workshops on writing CVs and filling out online applications.

Smith, who also has responsibility for recruitment, says that unfortunately the plant has received relatively few applications from women seeking technical jobs. "The reason may be that while many women have applied for office-based jobs at the plant, train manufacturing seems to be seen as work for men," she says. "Even women already working in manufacturing excluded themselves from working here," says Smith. To help redress that balance the plant has held two women-only open days to give females a taste of the working environment and the type of work done. The team is also working closely with the UTC by holding events to encourage more girls to study STEM and become the engineers of the future.

Yusuke Oyama (left) and Fumio Fujinaga, dispatched to Newton Aycliffe from the Kasado Works.

Jacquie Smith, who is in charge of CSR at the Newton Aycliffe plant