Special Feature

Establishment of Japan Transport Engineering Company (J-TREC)

Naoto Miyashita

Introduction

Japan Transport Engineering Company (J-TREC) started operations on 2 April 2012 as a wholly owned rolling stock manufacturing subsidiary of East Japan Railway Company (JR East). Its forerunner is Tokyu Car Corporation (TCC) with a 63-year history as a pioneering manufacturer of stainless-steel rolling stock in Japan (Table 1).

J-TREC's broad product line includes commuter and shinkansen high-speed trains for JR East and other private and public railways. All these commuter trains make full use of the company's advanced technologies for building stainless-steel cars. The company also builds express, diesel, and hybrid trains for conventional narrow-gauge lines, as well as LRVs. Additionally, it manufactures track components, such as turnouts, and containers.

This article covers the background to J-TREC's establishment, its business, and future outlook.

Background to J-TREC Establishment

On 27 October 2011, JR East announced its acquisition of management rights to TCC's rolling stock manufacturing business and J-TREC was established when the business transfer was completed on 2 April 2012.

JR East is Japan's largest railway company, operating 70 lines covering 7512.6 km. Its business spans a broad area across the Kanto, Koshinetsu, and Tohoku regions, and the company serves 16.5 million passengers every day (Table 2). Its 72 subsidiaries run other transport-related businesses, such as bus and monorail operations, retail and food service in stations, shopping centres in terminals, offices, and hotels. J-TREC is one of these 72 subsidiaries.

While JR East is a railway operator, it also launched its Niitsu Rolling Stock Plant in 1994 with technical assistance from TCC, where it builds stainless-steel commuter rolling stock. At late March 2013, the plant has built a total of 4037

Table 1 J-TREC Corporate Profile

Company Name	Japan Transport Engineering Company (J-TREC)
Head Office	3-1 Okawa, Kanazawa-ku, Yokohama 236-0043, Japan
Established	9 November 2011
Capital	¥3.1 billion
Number of Employees	932 (As of 1 April 2013)
President	Naoto Miyashita

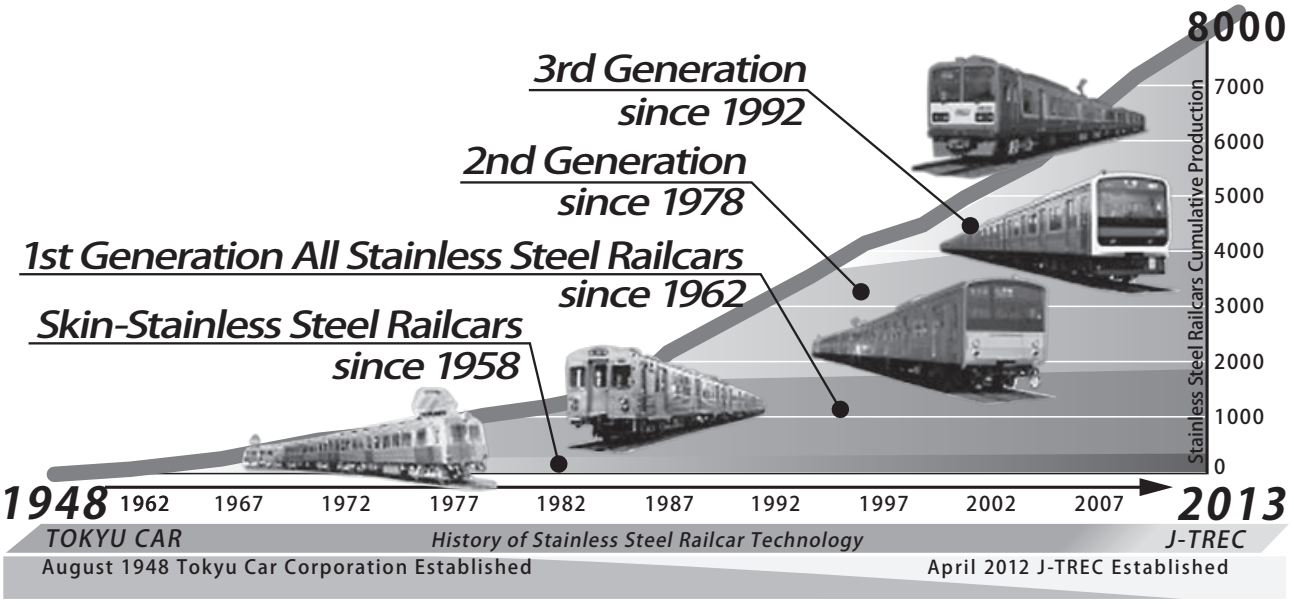
Table 2 JR East Corporate Profile

Company Name	East Japan Railway Company (JR East)
Head Office	2-2-2 Yoyogi, Shibuya-ku, Tokyo, Japan
Established	1 April 1987
Capital	¥200 billion
Number of Employees	59,130 (As of 1 April 2012)
Number of Stations	1689
Number of Rolling Stock	13,157
Average Number of Trains Per Day	12,757
Passenger Line Network	7512.6 km
Average Number of Passengers Per Day	16.50 million (2011)

rolling stock. By absorbing TCC's R&D capabilities as well as design and manufacturing skills for diverse types of rolling stock such as shinkansen and express trains into the JR East Group companies, J-TREC aims to create a synergy with Niitsu Rolling Stock Plant and hence establish its rolling stock manufacturing business as what JR East calls the 'fourth business pillar of operations'. (The first pillar is railway operations; the second is life-style, such as retail and shopping in stations; the third is Suica and IT business.)

By packaging rolling stock with JR East's comprehensive technologies, such as operations, maintenance and ICT, the company can meet the challenge of expanding into overseas markets too.

Figure 1 Production to Date



Series E7 Shinkansen Design (J-TREC)

As described above, TCC cooperated fully with the launch of the JR East Niitsu Rolling Stock Plant in every area ranging from facility planning to employee technical training and has since maintained a tight cooperative relationship with JR East. Since JR East had a close relationship with Tokyu Corporation (Tokyu), TCC's former parent, in various businesses such as terminal station development, Tokyu realized the potential of transferring management rights to JR East and then eventually transferred the rolling stock manufacturing business.

At the J-TREC startup, TCC's businesses in special-purpose vehicles and multilevel parking were spun off to other companies.

Business History and Overview

TCC was established as Tokyu Yokohama Plant Co., Ltd., in August 1948 to restore war-damaged rolling stock. It changed its name to Tokyu Car Manufacturing Co., Ltd. in 1953 and then built Japan's first stainless-steel-skin Tokyu 5200 EMU in 1958 followed in 1962 by Japan's first all-stainless-steel Tokyu 7000 series of rolling stock using a technical joint venture with Budd Company in the USA. Using these and other accomplishments, TCC established a firm footing as the top manufacturer in Japan of stainless-steel rolling stock. J-TREC has produced some 8000 stainless-steel rolling stock to date (including those built previously by TCC) and about 60% of commuter trains in Greater Tokyo today are now stainless steel. Work is now underway on developing the next generation of stainless-steel rolling stock.

TCC has also played a role in building Japan's high-speed rail network. Work in this field started in 1967 with the Series 0 shinkansen. Since then, the company has manufactured more than 800 cars for the Tokaido, Tohoku, Joetsu, Nagano, Yamagata and Akita shinkansen. Currently, J-TREC is designing and manufacturing Series E7 trains for the Hokuriku Shinkansen.

TCC also delivered the *Kiha* E200—the world's first diesel hybrid railcar—to JR East in 2007.

In recent years, the company has actively developed rolling stock implementing universal design, playing a pivotal role in improving passenger convenience.

Rolling stock is designed and manufactured at the Yokohama Plant, but the company also has a plant in Kinokawa City, Wakayama Prefecture—the only place

Kiha E200 Hybrid Train (J-TREC)

in Japan where rail-freight containers are manufactured. J-TREC also manufactures turnouts and other track components, supporting Japan's railway infrastructure with a broad product line (Figure 2).

Future Outlook

In its October 2012 JR East Group Management Vision V, the JR East group of companies adopted 'globalization' as a means of 'pursuing unlimited potential'. This vision sets out the policy of establishing rolling stock manufacturing as a 'fourth pillar of operations' and spreading Japanese railway technology to the world.

Japan's population is already declining and the environment for various JR group businesses looks bleak in the longer term. However, at the same time, there are many business chances outside Japan. In addition to the so-called 'Big Three' general railway equipment manufacturers (Alstom, Siemens and Bombardier) outside Japan, the rapid rise of Chinese and South Korean rolling stock builders stands out. Many rolling stock builders, especially in Europe, have characteristics that distinguish them from competitors, making it a tough challenge to compete with them.

Production of rolling stock for overseas markets during the TCC era started with rolling stock for Argentina in 1961. So far, the company has exported about 600 finished rolling stock to Asia, North America, South America, Europe, and elsewhere. The last rolling stock produced for markets outside Japan were EMUs for Irish Railway in 2004.

Looking at the total market for railway equipment outside Japan, although there is some market for high-speed rail such as shinkansen, most equipment is for urban railways

Figure 2 J-TREC Manufactured Containers and Turnouts

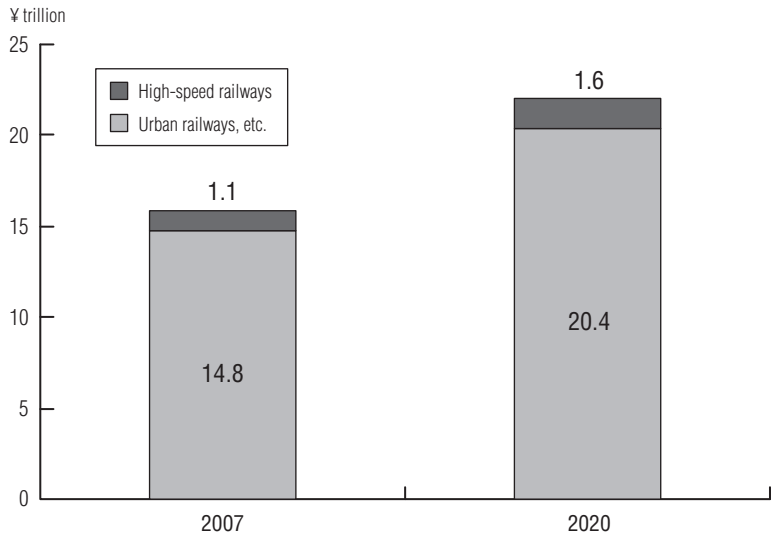
Sustina design image (J-TREC)

(Figure 3). Against this market background, J-TREC decided to actively market its premium stainless-steel urban railcars including for subways. Simultaneously, the company is perfecting design and manufacturing abilities for high-speed cars implementing the latest technologies through design and manufacture of the Series E7. By focusing on the importance of brand image when entering overseas markets, J-TREC branded its stainless-steel urban railway rolling stock 'sustina' to promote product excellence.

The 'sustina' brand name is derived from a combination of 'SUS', which is the Japanese Industrial Standards (JIS) abbreviation for stainless steel, and the word 'sustainable,' evoking the durability image of stainless steel (beauty, safety, reliability, recyclability).

The main features of 'sustina' are high reliability, low cost, long life, and low environmental burden. The rail network in Greater Tokyo carries 40 million passengers each day using about 20,000 cars (60% of which are stainless steel) with headways as short as 2 minutes on some lines (Figure 4). Achieving such a high transport density depends on high

Figure 3 Projected Changes in Scale of Global Railway Market (2020)



Source: 'Report by the Industrial Competitiveness Committee, Industrial Structure Council - Industrial Structure Vision 2010' Industrial Revitalization Division, Economic and Industrial Policy Bureau, Ministry of Economy, Trade and Industry

Figure 4 Transport in Tokyo Area

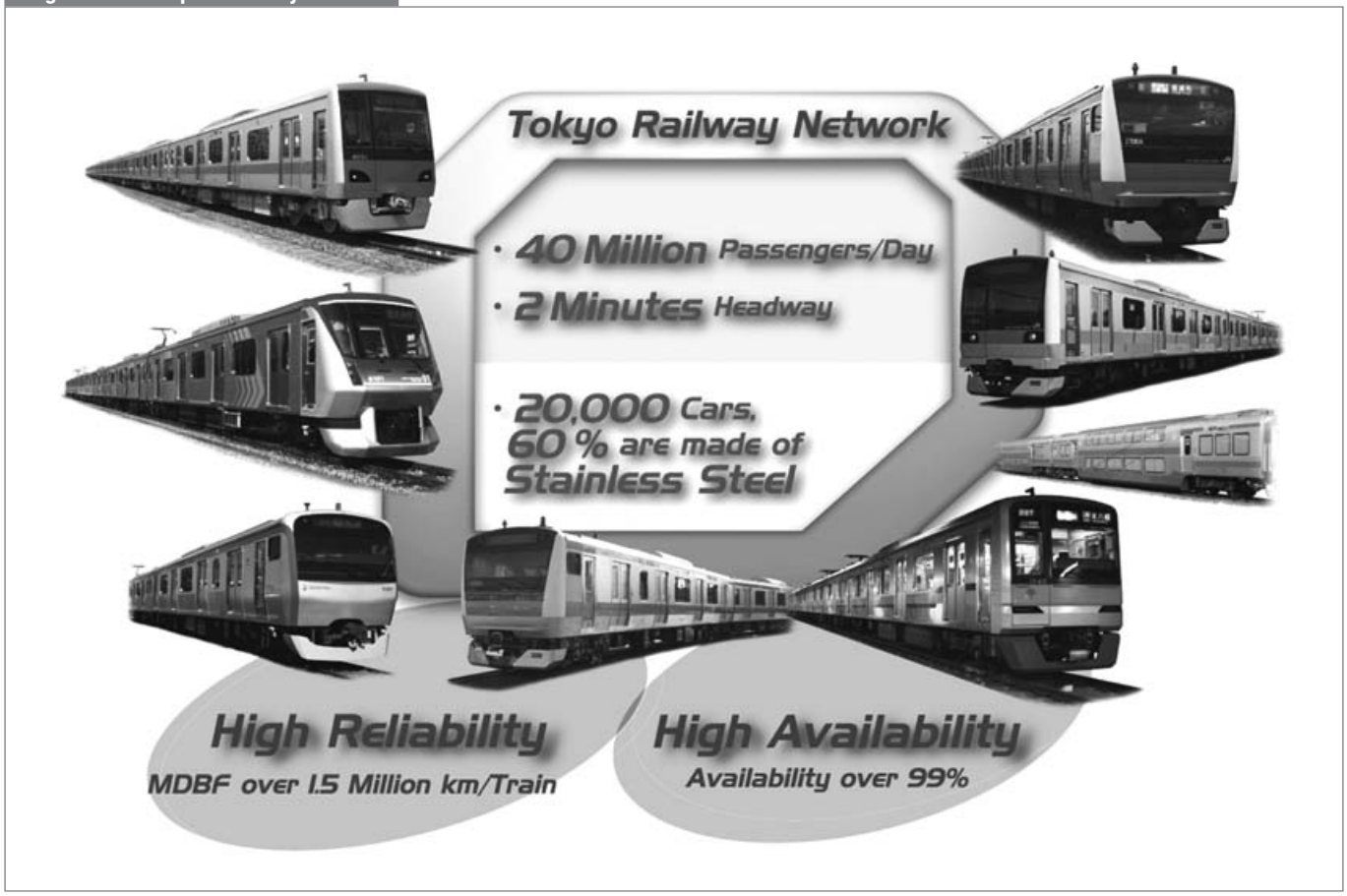
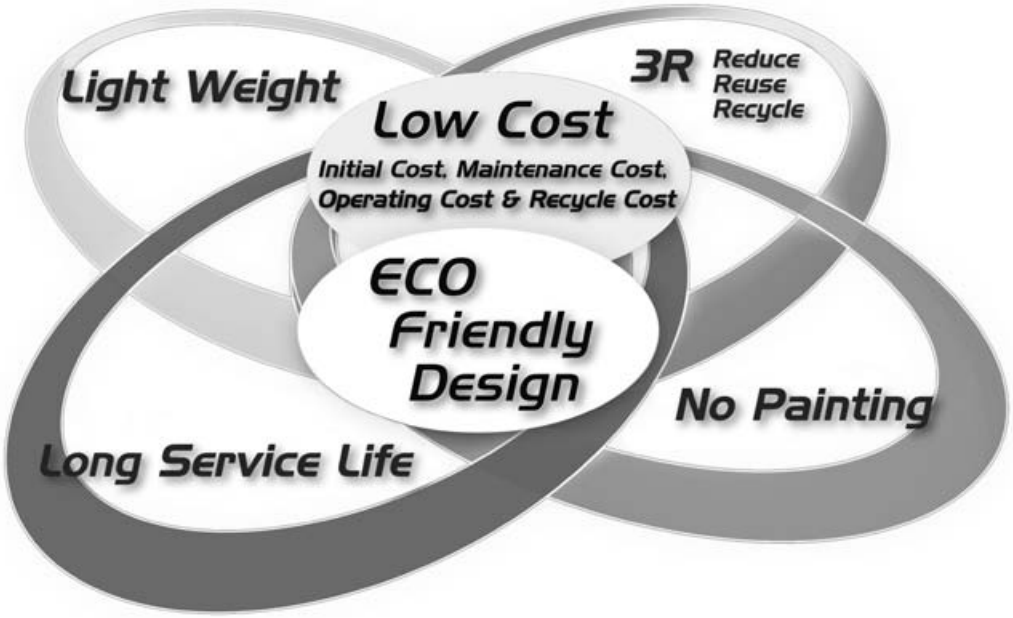


Figure 5 Features of Stainless Steel



reliability and J-TREC's latest rolling stock achieve a mean distance between failure (MDBF) of more than 1.5 million km and a high availability of more than 99% (counted as delays of 1 minute or longer due to breakdown of cars in commercial operation).

Stainless steel is very corrosion resistant, offering a long service life without painting or corrosion repairs. Also, the body is lighter because reinforcings to resist corrosion are unnecessary.

Thanks to use of the latest technologies, running costs are greatly reduced through lower maintenance and labour costs in areas including running gear and driving devices, streamlined maintenance equipment, energy savings offered by lightweight rolling stock and reduced track maintenance through less wear and tear on rails. The stainless-steel cars also incur low environmental burdens because no paint is used and the materials can be recycled (Figure 5).

The 'sustina' brand image was specifically promoted at the InnoTrans 2012 international railway technology trade fair in Berlin, Germany, in September 2012, and J-TREC is also considering establishing 'sustina' as a brand in Japan by developing it further as a product for the JR operators and other private and public railways.

In recent years, projects outside Japan have become the focus of attention because they provide a maintenance and operation management package as well as supply of rolling stock. As a JR East subsidiary, J-TREC can access JR East's huge know-how in maintenance and operations, consolidating the ability to provide maintenance, operations, and rolling-stock packages.

J-TREC is targeting new business in markets outside Japan based on its broad range of high-quality and low-cost technologies centred around its premier sustina stainless-steel rolling stock, as well as high-speed, urban railway, diesel, and hybrid trains. At the same time, the company can provide comprehensive packages of railway technologies backed by other members of the JR East group of companies to contribute to global development by spreading Japan's railway technologies. ■

Naoto Miyashita

Mr Miyashita is President and Representative Director of Japan Transport Engineering Company (J-TREC). Prior to his current position, he was an Executive Director, and Deputy Director General of Railway Operations Headquarters at JR East.