Overview of Research and Development Center of JR East Group

1 Objectives of the Center

In the "New Frontier 21", a mid-term business concept announced in 2000, the JR EAST group declared its commitment to become the "world's best railway company" in both technologies and services as a "technology service firm", and to reform the entire railway system by creation of a new technology and value. It also declared that, in the field of research and development, a new value will be created by making effective use of the technologies accumulated so far and by further accumulating advanced technologies, thereby achieving the target of developing a safe, reliable, accurate, comfortable, and easy-to-use "On-demand railway system, eetrain" meeting customers' diversified requirements (Fig. 2).

The Research and Development Center of JR East Group built in Saitama City has the role of serving as a traction engine in our effort to develop a new railway system "eetrain".
JR East has been promoting development of both technologies and human resources mainly in the Technical Development and Research Department, Technical Center and Safety Research Laboratory as an affiliated organization. Research and Development Center of JR East Group was founded as an organization affiliated to the head office having four internal organizations. It is organized to integrate these research organizations and to combine them in one place, thereby creating a framework that would allow all the research organizations to band together.

In the head office organization of JR East, the Technical Development and Research Department was reorganized as the Technology Planning Department. This Department is assigned with the tasks of planning, evaluating and support the research and development programs to carry out research and development in conformity to the requirements of the company, and also with the work of protecting intellectual property rights.

The newly established organizations are Frontier Service Development Laboratory and Advanced Railway System Development Center. The Safety Research Laboratory and Technical Center were relocated and integrated.

The following describes the major role of each organization:

(1) Frontier Service Development Laboratory
Frontier Service Development Laboratory is making research and development efforts to create a more comfortable traveling environment and to generate new demands, while trying to form a close relationship with the customers and inhabitants of local communities. Three fields are included in the scope of research and development programs. They are (a) “creation of value” for creating new life styles and services through marketing, (b) “creation of comfort” for ensuring comfortable traveling by meeting diversified requirements and (c) “creation of space” to produce a space to provide service at lower costs.

(2) Advanced Railway System Development Center
The Advanced Railway System Development Center encourages active use of the cutting edge technologies including information technology and the application of general-purpose technologies, and is committed to innovation of the railway system centering the rolling stock and control system to achieve an innovative railway system. The major development themes include “world’s best Shinkansen”, “rail cars meeting 21st century requirements”, “innovation of control systems”, “innovation of transportation systems” and “development of Value Engineering technologies”.

(3) Safety Research Laboratory
The Safety Research Laboratory is committed to improving the level of safety for the entire railway system where a major objective is to completely eliminate the possibility of injuries or death of passengers and members of the companies cooperating with us.

In launching research and development programs, we set up three basic goals; (a) innovation of a railway safety system by effective use of cutting edge technologies including information technology, (b) establishment of fundamental railway safety technologies and basic theories through steady accumulation of know-how, and (c) research of human factors closely related to safety. Research and development programs of Safety Research Laboratory may be carried out according to the horizontal project method by keeping a close ties with other sections in the Center.

(4) Technical Center
The Technical Center is committed to technology development aiming at innovation of maintenance work based on three major goals; (a) cost reduction, (b) improving reliability, and (c) worksite support. In addition to the research method of making an in-depth study of specific development themes for each of the technological fields of the rolling stock, facilities and electricity, our major emphasis is placed on the development aiming at the optimization as a whole, regarding the border area, for example, between the rail and wheel or between the contact wire and pantograph across different engineering fields.

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Up until now, we have had no facilities for conducting experiments. So, we conducted tests using the experiment facilities of the Railway Technical Research Institute. Further, before commercial use, we installed the test products that we had developed at the worksite and conducted durability tests to verify their functions. Now, test facilities have been established in the experiment building inside the Center. This has made it possible for us to acquire technological expertise and evaluation capabilities through a series of jobs such as setting up the test conditions, measurement and analysis of data, where the major objective is to study technologies inherent to railways. Further, much time and effort required for the field test can be eliminated, and effective development can be carried out by making effective use of the test facilities. At the same time, the development period can be reduced by the intensive test that allows a long-term durability test to be completed in a short time.