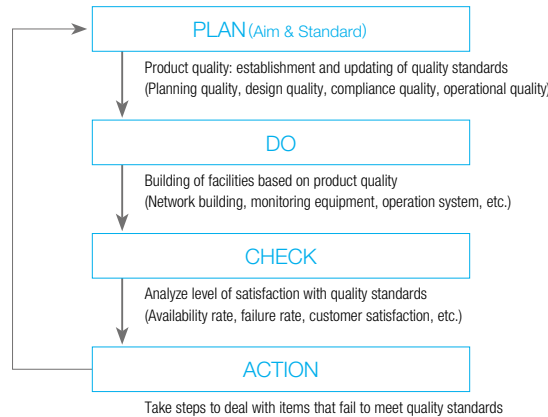# Providing Reliable Service

System

Service Quality Management System

At KDDI, we have a lot of communications facilities including optical fiber cables and mobile phone base stations which are maintained and managed by a nationwide network of operations departments and technical centers. KDDI's Operation Center centrally monitors communications nationwide 24 hours a day, 365 days a year. It is responsible for appropriate communication control as well as recovery work in cooperation with operations departments across Japan in the event of failure. With regard to service quality, we are constantly working to offer high-quality, reliable communication services by building, analyzing and improving the facilities and operation system in accordance with our own strict standards based on our management system.

Multiple Surveillance and Controlling Operation Centers

Center	Role
Mobile Operations Center	In charge of surveillance of the au mobile phone network and fixed-line phone network
Server Operations Center	In charge of surveillance of the server facilities
Network Operations Center	In charge of surveillance of landline backbone circuits and station building, electric power and air conditioning equipment
Technical Service Center	In charge of surveillance of private corporate lines and VPN lines
IT Outsourcing Center	In charge of surveillance of individual solution equipment and operation of the data center
Security Operations Center	In charge of detection, analysis and defense against cyber attacks
Global Network Engineering & Operations Center	In charge of overall surveillance of international circuits and video circuits

PLAN(Aim & Standard)
Product quality: establishment and updating of quality standards
(Planning quality, design quality, compliance quality, operational quality)

DO
Building of facilities based on product quality
(Network building, monitoring equipment, operation system, etc.)

CHECK
Analyze level of satisfaction with quality standards
(Availability rate, failure rate, customer satisfaction, etc.)

ACTION
Take steps to deal with items that fail to meet quality standards

Activities and Results

Offering Reliable Information and Communications Services

■ **Network Service Enhancement Project**

We launched the "Network Service Enhancement Project" with the aim of identifying and speedily rectifying issues, based on customer feedback through our communication network service. Through this project, we aim to solve problems promptly by a system that cuts across relevant departments including sales, operations, products, and technology and equipment.

■ **Maintenance and Operation of Global Network**

KDDI connects communications providers around the world to their networks. In cooperation with these companies, we maintain and operate a global network linking all parts of the world. As well as offering high quality international communication services using highly reliable optical fiber submarine cables, KDDI aims to offer services using new technologies centered on its IP services.

Submarine cables provide 99% of Japan's international traffic*, making them an important component of the social infrastructure. Moving forward, KDDI aims to provide an unprecedented level of reliability in communication services for the Asia-Pacific region, where demand is expected to continue growing.

In addition, through partnerships with companies such as INMARSAT and Intelsat, KDDI offers services using satellite communications, enabling call and data transmissions to anywhere in the world, including ships at sea, airplanes, the South Pole, and other remote areas such as islands where cables do not reach.

* According to research by KDDI.

Link Website   INMARSAT service

Activities and Results

Launch of "FASTER" Optical Submarine Cable System Between Japan and U.S.

"FASTER", a optical fiber submarine cable between Japan and the U.S. constructed by a consortium formed by KDDI together with China Mobile International (China), China Telecom Global (China), Google (U.S.), SingTel (Singapore) and Global Transit (Malaysia) started service in June 2016. FASTER is 9,000 km long and has a transmission capacity of 60 Tbps, 1.5 times the previous transmission capacity between Japan and the U.S. To boost FASTER's reliability, there are two cable landing stations in Japan, in Minamiboso, Chiba Prefecture and Shima, Mie Prefecture. The cable landing station in

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Minamiboso is an elevated station located 28m above sea level, so it will not be affected by any tsunami that may occur. Together with the Unity cable between Japan and the U.S. that came into service in 2010 and the SJC cable in Asia that came into service in 2013, FASTER will support communication services in the Asia-Pacific region where demand is expected to continue growing.

Activity and Results

New Construction of Global Data Centers with Highest-Class Power Supply Capacity in Japan

In FY2015, KDDI constructed two new data centers, TELEHOUSE OSAKA 2 (Osaka City, Osaka) and TELEHOUSE TOKYO Tama 3 (Tama City, Tokyo), equipped with an electrical power supply capacity that ranks among the highest in Japan[1]. With the construction of these facilities, the network of TELEHOUSE data centers will span 48 sites (including 21 sites in Japan) located in 24 cities in 13 countries and regions around the world, and the total floor space of all data centers will measure approximately 447,000 square meters.

TELEHOUSE OSAKA 2 exterior

TELEHOUSE TOKYO Tama 3 exterior

In addition to the high-capacity power supply, both data centers boast an environmentally-friendly design that incorporates features such as highly efficient and reliable power-supply equipment, energy-efficient air conditioning, LED illumination, and motion detectors that sense the presence of people. The centers have been approved for the Environmental Eco Label[2] as ICT services that contribute to reducing the impact on the global environment.

The buildings also incorporate a seismic base isolation system that offers protection from earthquakes and minimizes the impact on customers when they occur.

Furthermore, the network cables traverse different routes underground, enabling communication services to be provided with a level of stability that only a telecommunications operator can achieve. Use of these data centers can serve as effective BCP[3] and DR[4] measures when a disaster occurs, which can help customers maintain safe and secure business operations.

[1] TELEHOUSE OSAKA 2 power supply capacity to each rack: 30 kVA (rated) TELEHOUSE TOKYO Tama 3 power supply capacity to each rack: 42 kVA (rated), the highest in Japan*
* As of August 26, 2014, according to research by KDDI based on public information.
[2] The Environmental Eco Label is provided to services that contribute to reducing carbon dioxide emissions through the use of ICT services offered by KDDI. The applicable services are indicated by the KDDI Eco Mark.
[3] BCP is an abbreviation of "business continuity plan", which refers to a plan to secure the continuity or quick recovery of important business operations in the event of a disaster.
[4] DR is an abbreviation of "disaster recovery", which refers to measures to prevent or recover from system failures that occur due to disaster.

System

Response to Product Accidents and Base Station Construction

■ Response to Product Accidents and Defects

When an accident or defect occurs with a KDDI product, a report is sent to the Product Accident Response Desk in each relevant department at KDDI, and a response plan is promptly established upon consultation with the Survey Committee, which is chaired by the president. In the case of a serious product accident, customers are notified immediately and thorough reports are filed with the relevant government agencies.

■ Auditing of Base Station Equipment Production Plants

KDDI conducts thorough quality control of equipment to be used in mobile phone base stations to ensure a stable communication environment for customers. Because failures in base station equipment can lead to communication difficulties over a whole area, we perform audits at plants which produce equipment for KDDI base stations.

Audits consist of strict checks of production processes and the production environment in order to eliminate a variety of causes of malfunctions and defects. If there are problems, we communicate them to the plant and take painstaking preventative action against breakdown of equipment.

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Specific case examples of auditing:

・Ensuring that the 5S measures (Sorting, Setting in Order, Shining, Standardizing, and Sustaining Discipline.) are implemented properly

・Ensuring that the specified values are maintained within electrostatic protection areas

・Ensuring that the appropriate temperature and humidity are maintained within parts storage rooms

・Ensuring that the details of assembly procedures and visual inspections are clear, and that they are performed properly

To allow our customers to use mobile phones and smartphones with peace of mind, we will continue to ensure our manufacturers and suppliers understand KDDI's quality control philosophy and work together with plants to reduce the number of equipment malfunctions.

Through the auditing performed in FY2015, KDDI found no issues affecting product quality.

■ **Setting Up Mobile Phone Base Stations and Neighborhood Care**

With the aim to provide a reliable communications environment to au mobile phone users, KDDI sets up mobile phone base stations in all parts of Japan in order to support new services and improve service area quality. For the design and construction when setting up a new base station, we abide by the Radio Act, Building Standards Act, and other relevant laws and regulations as well as municipal ordinances and guidelines.

Furthermore, in cases where the construction is expected to cause a nuisance or inconvenience to the neighborhood (for example, due to the traffic of construction vehicles and noise from construction) or if we received inquiries regarding a mobile phone base station, KDDI provides general information about the base station and explanation of the construction work so that we can earn the understanding and cooperation of the neighborhood.

■ **Operating More Than 30,000 4G LTE Base Stations That Support a Maximum Downlink Speed of 150 Mbps**

To further improve communication quality, KDDI and Okinawa Cellular Telephone Company adopted 4G LTE in October 2013.

Then in May 2014, KDDI introduced Carrier Aggregation, which is supported by next-generation high-speed LTE-Advanced technology.

The number of base stations that support a maximum downlink speed of 150 Mbps currently stands at over 30,000. KDDI will continue its efforts to improve service area quality in FY2016.