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No. 2765

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Mitsubishi Electric Begins Testing New Proton Therapy Technology

New technology aims to cut irradiation time by up to 75%

TOKYO, May 15, 2013 – [Mitsubishi Electric Corporation](http://www.mitsubishi-electric.com) (TOKYO: 6503) announced today that it has completed the construction of a new proton therapy system for cancer treatment at its Energy Systems Center in Kobe, Hyogo Prefecture. The company has started testing of the new technology including a high dose-rate beam delivery system which reduces the irradiation time to one fourth of the current level.

Mitsubishi Electric plans to perform the quality verification testing of this new system in collaboration with clinical institutions, and also utilize the preferred status granted as a member of the Kansai Innovation Comprehensive Global Strategic Special Zone in order to obtain early approval as a medical device.



New Proton Accelerator (Synchrotron)



Beam Line for Testing

Key Technologies to be Tested

1) High dose-rate beam delivery system

The new beam delivery system is intended to increase the maximum dose rate from 5Gy/min to about 15 to 20Gy/min at all depths, reducing the time to irradiate a tumor by as much as a factor of four over the current level. The shorter irradiation time provides a more comfortable setting for the patient.

2) High-accuracy pencil beam scanning technology

The new system increases the scanning speed five fold from 20mm/ms to 100mm/ms. At the same time the spot size is reduced in half from 10mm to 5mm. This means that the proton beam can be delivered more accurately more efficiently to complicated tumor volumes.

3) Universal nozzle for efficient operation

The treatment system supports a new nozzle capable of both pencil beam scanning and broad beam treatment. In pencil beam scanning, a finely focused particle beam is magnetically scanned across the tumor, tracing out the three-dimensional tumor volume. In broad beam treatment, the particle beam is spread out to create a uniform field. Using collimators, the treatment field is cut out from this uniform field according to the tumor shape. The nozzle is capable of quickly switching between the two modes of treatment.



Accelerator Test Facility



Test Facility Showroom

Accelerator Test Facility at the Energy Systems Center, Kobe

Purpose	<ul style="list-style-type: none"> • Evaluation of new technologies • Perform tests according to customer requests from existing or planned facilities • Showcase the new treatment room designs
Particle Type	Proton
Accelerator Type	Newly developed synchrotron with variable energy capable of providing high beam-quality for pencil beam scanning, at all treatment depths.
Maximum Energy	235 MeV

Mitsubishi Electric has 50 years of experience and expertise in the fields of radiation therapy and accelerator systems, which the company combined to develop the particle therapy system. In 2002, Mitsubishi Electric obtained approval from the Ministry of Health, Labour and Welfare in Japan to manufacture and sell the proton therapy systems. In 2005, the company became the first manufacturer in the world to obtain approval for the carbon/proton-type therapy systems. In March 2010, approval was obtained for the “Compact

Carbon-Type Particle Therapy System,” which was developed on the basis of the research work led by the National Institute of Radiological Sciences. To date, the above three types of systems have been installed at a total of eight facilities in Japan.

Mitsubishi Electric will continue to develop new technologies for the advancement of particle therapy, and in collaboration with clinical institutions, provide treatment systems that are safe and easy to use.

Facility	Prefecture	Year	Ion Species
National Institute of Radiological Sciences	Chiba	1994	carbon
Hyogo Ion Beam Medical Center	Hyogo	2003	proton/carbon
Shizuoka Cancer Center	Shizuoka	2003	proton
Southern TOHOKU Proton Therapy Center	Fukushima	2008	proton
Gunma University Heavy Ion Medical Center	Gunma	2010	carbon
Fukui Prefectural Hospital Proton Beam Cancer Treatment Center	Fukui	2011	proton
Medipolis Medical Research Institute	Kagoshima	2011	proton
SAGA Heavy Ion Medical Accelerator in Tosu	Saga	2013	carbon

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About Mitsubishi Electric

With over 90 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of 3,567.1 billion yen (US\$ 37.9 billion*) in the fiscal year ended March 31, 2013. For more information visit <http://www.MitsubishiElectric.com>

*At an exchange rate of 94 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2013