

News Release

FOR IMMEDIATE RELEASE

Start of Operation of Power Supply System for Large Gamma-Ray Telescopes Being Constructed as a Part of the CTA Project, a Joint International Project with the Participation of the Institute for Cosmic Ray Research of the University of Tokyo and Others

Special power supply system developed by applying technology for data center construction and operation delivered to observatory in Spain



Gamma-ray telescope (left) and power supply system provided by Hitachi Systems (right)

Tokyo, October 5, 2018 – Hitachi Systems, Ltd. ("Hitachi Systems"), a wholly owned subsidiary of Hitachi, Ltd. (TSE: 6501), today announced that a special power supply system developed by applying technology for data construction and operation was delivered and will start operation from October. The power supply system is for large gamma-ray telescopes being constructed as a part of the Cherenkov Telescope Array (CTA) project, a joint international project with the participation of research organizations from 32 countries including the Institute for Cosmic Ray Research of the University of Tokyo, directed by Takaaki Kajita, located at Kashiwa-shi, Chiba in Japan.

The CTA project is a joint international project to construct gamma-ray observatories with a sensitivity some 10 times that of current equipment to be capable of observing a wide range of photon energy in order to clarify the mysteries of dark matter, which is thought to account for some 25% of the universe, and black holes. The project includes the participation of some 1,200 researchers from 32 countries, including that of the Institute for Cosmic Ray Research of the University of Tokyo from Japan, whose director is Takaaki Kajita, a winner of the Nobel Prize in Physics.

Enabling gamma-ray telescopes to observe gamma rays when an unexpected physical phenomenon referred to as "gamma-ray bursts" occurs can help to clarify the mysteries of black holes and dark matter. However, considering various observation conditions, an observable gamma-ray burst is expected to occur once a week and the duration is only about 1 to 1,000 seconds. Therefore, the gamma-ray telescopes must rotate to face the target direction instantly when a burst occurs. In order to capture such a rare chance, the gamma-ray telescopes must normally stop or rotate slowly in accordance with the course of the stars so that when a gamma-ray burst occurs, the telescopes can instantly rotate in the direction where the burst is arriving and start observation. The rapid rotation requires a great deal of electric power but it is difficult to continuously maintain the large power due to power supply conditions in the area of the observatory and the required costs. For these reasons, the CTA project requires a power supply system that can normally provide a stable supply of low power for the gamma-ray telescopes while also storing energy in batteries so that a large amount of power can be provided quickly when necessary. However, there was no such power supply system anywhere in the world.

As a means to contribute to the CTA project with the construction of this special power supply system, Hitachi Systems, in conjunction with Powerware Systems Sdn Bhd which is an affiliated company of Hitachi Sunway Information Systems Sdn. Bhd. headquartered in Malaysia, applied technology developed for data center construction and operation to developing a container-type special power supply system that combines uninterruptible power supply (UPS) and flywheel batteries^{*1}. The developed power supply system has been delivered to the gamma-ray observatory located on La Palma Island in the Canary Islands of Spain.

UPS is a device with batteries to supply power to other equipment while storing reserve power in case of power outage or other failures. UPS is traditionally deployed in data centers. Although typical UPS systems use lead acid batteries, this special power supply system uses flywheel batteries. This is a request from the Institute for Cosmic Ray Research of the University of Tokyo. Considering safety and the environment of the gamma-ray observatory, which is located at an altitude of 2,200 meters, they want the excellent maintainability, environmental friendliness, and compact size of flywheel batteries. In addition to the UPS and flywheel batteries, the container contains precision air conditioning equipment and a remote monitoring system using IoT technology to support stable operation.

With these components, this power supply system, the first of its type in the world, can provide a stable low power supply during normal operation while also continuously storing energy so that when a gamma-ray burst occurs, the system can supply the large amount of power required to rotate the telescopes in the target direction in only

10 seconds. This power supply system provides a solution to the power supply problem that is a major issue for observing gamma-ray bursts.

Hitachi Systems will provide maintenance for the power supply system delivered to the gamma-ray observatory on La Palma Island. In addition, Hitachi Systems has proposed providing this same power supply system for the gamma-ray observatory scheduled to be constructed in Paranal, Chile in 2020, which will also serve to support the CTA project seeking to explain the origins of our universe.

*1: Flywheel battery: A power supply device in which the internal flywheels are rotated by a small amount of electric power and the corresponding inertia is used to store energy.

About Hitachi Systems, Ltd.

Hitachi Systems is a leading IT service provider specializing in developing and implementing business systems for customers of diverse sectors and sizes. We also operate, monitor, and maintain those systems by using a multi-tiered service infrastructure comprising data centers, network and security operations centers, contact centers, and a nationwide network of around 300 service sites. Hitachi Systems assists customers with their digital transformation needs and works with them in creating new value by delivering unique services that leverage our diverse human capital and advanced IT solutions. We strive to become a global service company that earns the complete trust of customers.

For details: <https://www.hitachi-systems.com/eng/>

About Powerware Systems Sdn Bhd

Powerware Systems Sdn Bhd, an affiliated company of Hitachi Sunway Information Systems Sdn. Bhd., is a Malaysian company that performs data center consulting, design, and construction, as well as related services such as project management and support.

Visit <http://www.pws.my/> for more details.

###