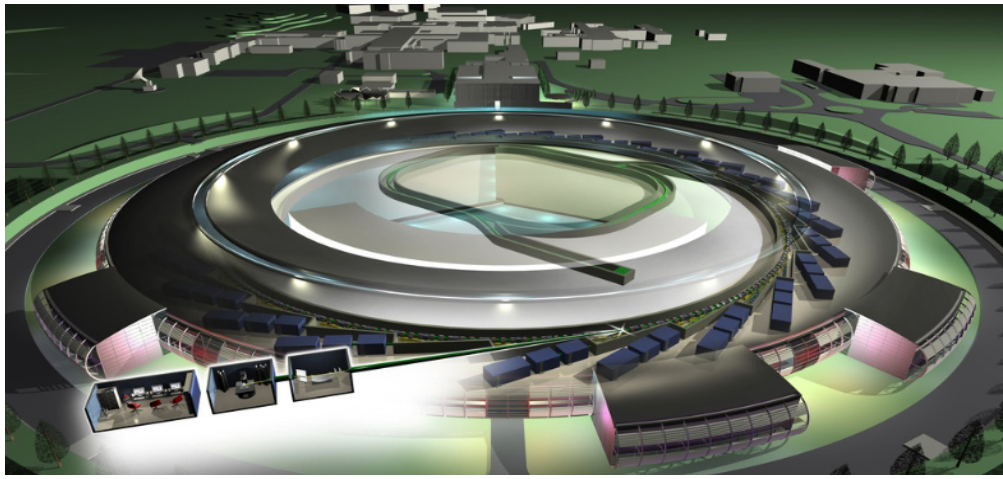
Customer: **Diamond Light Source**

# POWER PROTECTION FOR PIONEERING SCIENTIFIC RESEARCH



**Multi Sentry's proven performance make it the ideal solution to protect sophisticated scientific equipment that is at the forefront of some of the country's most groundbreaking research.**

Located at the Harwell Science and Innovation Campus in Oxfordshire, **Diamond Light Source** is the UK's national synchrotron facility.

The not-for-profit company, a joint venture funded by the UK Government through the Science & Technology Facilities Council (STFC) in partnership with the Wellcome Trust, is used by over 7,000 researchers from both academia and industry to conduct essential experiments that keep the UK at the forefront of scientific research.

At the heart of the world-leading research centre lies a giant machine, half a kilometre in circumference, called a synchrotron.

It works like a massive microscope, harnessing the power of electrons by sending them through three particle accelerators to near light speeds so that they give off light 10 billion times brighter than the sun.

These intense beams, predominantly in the X-ray region, are then directed into laboratories known as 'beamlines', of which there are currently 31 operational onsite.

Scientists use them to study a vast range of subject matter down to the level of atoms and molecules.

The applications are broad, ranging from smarter materials and better data storage, to clever clean-up solutions for plastic pollution, as well as the preservation of significant historical artefacts such as The Mary Rose.

Synchrotron light has also played a pivotal role in the study of diseases such as Foot and Mouth and Polio, vital antibiotic research, and other areas of medical science.

## DOWNTIME FOR SYNCHROTRON

The beamlines operate at the micron level and below and are incredibly precise. To achieve this precision, each one has to be calibrated through several items of equipment.

If power were to be lost, or even slightly interrupted, they need to be completely re-calibrated. This would take 1-2 weeks for each beamline, losing valuable research time.

Diamond Light Source has also recently become the UK's largest electron microscope hub, with eight top of the range microscopes on site.

The heating element in the tip of each microscope is a sensitive filament. If the power is turned off without letting it cool down, it will be destroyed and need replacing.

Because of the importance of the research being undertaken and the sensitivity of the equipment, the facility requires robust and reliable critical power protection at all times.

Authorised Riello UPS reseller and service partner **Specialist Power Systems** was commissioned to design and install a bespoke UPS to ensure ongoing critical power protection across the complex site.

## CHALLENGING INSTALLATION

With beamline time at a premium, ongoing power availability is crucial in supporting the integrity of Diamond Light Source and the services it provides.

The project needed to be completed quickly and efficiently over a six-month period, working to a time line of eight weeks on and three weeks off to ensure minimum downtime.

As a scientific facility where around 600 staff are located, there was a challenge in the amount of input needed from different sources.

**Andy Reed, Head of Electrical Facilities at Diamond Light Source**, explained: "Due to the nature of the facility, we have limited downtime to play with.

"With eight weeks of solid running time followed by three week-long shut downs, we knew it would be a real challenge to replace the existing systems to the standard required in the time provided.

"The existing UPS was a 'closed protocol' system, meaning the units were 'locked out' to anyone other than the manufacturer.

"This had caused several issues since the initial installation many years ago, so it was important that we weren't limited to one maintenance option going forward and the new system from Riello UPS offered a more open approach."

## A MULTI SENTRY SOLUTION

Following an extensive review of the facility's requirements and input from those who work there day-in-day-out, Riello UPS's **Multi Sentry (MST)** was selected as the most suitable system.

The state-of-the-art UPS has the highest possible level of online double-conversion performance. It is specifically designed to protect critical information and telecommunications systems, networks, services, and processes where operations could be disrupted by poor power quality or breaks in the mains power supply.

In addition to reliability and value for money, the Riello UPS Multi Sentry offers an advanced communication 'open protocol', making it easier for those working onsite to monitor loading and battery autonomy.

The large front panel graphic display provides vital information, such as real-time measurements, operating status, and alarm conditions.


## ONGOING SUCCESS

The UPS installation was completed three months earlier than the expected six months, which meant significant cost savings and reduced downtime for the facility.

Another added benefit was the fact that no power load was lost during the implementation.

Since the initial install, the facility now operates 41 Riello UPS Multi Sentry units, 13 x 120 KVA units and 28 x 30 KVA units.

Diamond Light Source uses a parallel UPS design for complete protection against power failure. For example, if two UPS units are needed to support the critical load, they will run three in the unlikely scenario that one fails.

**Andy Reed of Diamond Light Source** concluded: "In recent years, UPS failure has been a real issue for us and has had a knock-on effect with the laboratories and scientists we work with.

"However, with the new Riello UPS installation, we have had total confidence from start to finish and also feel we have an added level of protection with the ongoing maintenance support.

"We use Riello UPS's monitoring software to enable us to view the status of the units at all times, and Specialist Power Systems also provide continued onsite maintenance which is undisruptive to our work."