

Keeping the Landing Lights on at Riga International Airport

How Piller Uniblock UPS with integrated Powerbridge Flywheel Energy Storage Back Up Technology is helping aircraft land safely and keep moving smoothly on the ground at Latvia's international airport

THE OBJECTIVE

Riga Airport (RIX) is a fast-growing Northern Europe transport hub with rapidly expanding passenger and freight turnover.

Prior to the pandemic 7.8m million passengers used RIX in 2019 and through its "Medium-Term Strategy 2021-2027" the airport is investing for growing passenger numbers and freight tonnage over the coming decade.

Development projects include a new 30,000m² passenger terminal, the RIX Cargo City terminal, and an Airport Business Park.

As a vital part of Latvia's critical transport infrastructure and national economic growth driver RIX is building a strategy on openness, transparency, and sustainability.

The airport operator is committed to the development of safe and sustainable infrastructure that meets future demands. Riga Airport is a participant in the Sustainability Index of the Institute for Corporate Sustainability and Responsibility. In 2019, the Sustainability Index awarded RIX a Platinum sustainability rating, the highest available.

To continue to operate efficiently and meet its future targets while best serving its airline customers, RIX must ensure safe landings, and keep aircraft moving safely and smoothly once on the ground.

To that end Airfield Ground Lighting (AGL) of the runway, of the airfield apron and taxi ways is one of the most critical pieces of infrastructure for safe and efficient airport operation.

Such lighting systems require 100% uptime. Therefore, any changes to the power back up infrastructure on which AGL operating airport.

The team at RIX recognise that power infrastructure decisions are long term. This means they are preceded by forensic detailed analysis of every technical and business consideration in order to provide the confidence of many years of cost effective, reliable and sustainable operation.

The combination of delivering growth with the day-to-day operation of running a safe airfield means any power infrastructure change is viewed as a challenge for today and for the future.

CHOICE OF SOLUTIONS AVAILABLE

In 2018 RIX identified a load issue related to power generation and AGL energy consumption. Left unaddressed this could potentially have resulted in overdemand on the available power of the existing UPS and back-up infrastructure.

Powering the AGL and guaranteeing back up power availability was becoming a daily concern. This required constant monitoring and management and notifications were being generated on a regular basis which warned of issues with the power source when smooth airfield operation required an increase of power to the AGL equipment.

A detailed study of the issues behind the technical difficulties presented clear evidence that a capacity upgrade built around a long-term solution was needed.

The decision to conduct an infrastructure refresh was taken. It was soon realised that such a project also presented a rare opportunity to remodel the power back up system.

An end-to-end technical evaluation provided insight into the harsh operating conditions of the AGL and the demands on the UPS. Standalone traditional separation of UPS and power source was considered. It was soon clear that such a solution would not provide the required long-term levels of availability, reliability, and power security. Research and technical consultation, which involved RIX AGL system provider ADB Safegate, directed the team's thinking towards an integrated DRUPS solution with flywheel energy storage as technically suitable for the application.

Ģirts Pelīte, Head of the Electrotechnical Team at RIX says: "Assessment was one of the most difficult stages. As a state-owned company every detail has to be identified and every outcome and requirement understood prior to the commencement of any tendering process."

A major challenge was educating the senior management of the airfield on the technical advantages that a combined rotary UPS system would provide. This involved providing detailed engineering and technical information on operation and reliability to a non-technical audience and a detailed and precise cost analysis.

"To get management approval for the team's preferred approach meant explaining all the details about why these combined solutions are more reliable and cost effective compared to a standard solution using separate units," says Pelīte.

"The system was implemented, commissioned and tested with no interruptions to any flights."

WHY PILLER?

For RIX, any changes to critical power infrastructure supporting AGL systems while handling the normal day to day operational pressures of running a modern airfield meant finding a partner with the technology, experience and expertise to deliver.

From the beginning of the engagement Piller worked closely with local Latvian partner Energokomplekss, an independent power consultant and supplier known for its expertise and professionalism that has served the Latvian national market and nearby region since 2006.

Piller and Energokomplekss provided an evaluation which included detailed technical presentations, analysis and a demonstration of an existing use case supporting a similar application.

Piller provided a lifecycle analysis of DRUPS which included long term data on maintenance, repair, and servicing. The calculations made it possible to prove to RIX management that in total lifecycle terms this would prove to be more cost effective in the long term when compared to a traditional UPS solution.

It was agreed that Piller would arrange a reference site visit with the RIX team, Energokomplekss, and the contractor to Düsseldorf Airport to show Piller units under live operation, running an AGL application.

A combination of the technical analysis, customer feedback from the live reference site, and the obvious close collaboration between Piller and its partners meant the airfield's power team saw "it was clear this was the right technology and team and for our requirements."

The product build quality, ability to deliver on time, engineering expertise, time taken to gain a deep understanding of the specific challenges of the project and the circumstances of the deployment and commissioning, along with provable examples of how the solution behaves in the field saw RIX opt for Piller.

THE SOLUTION

The tender was issued in Q2 2020 and in April 2021 Piller was contracted for the delivery of:

- 1x UBTD+ 1000 kW Diesel UPS unit and 1x UBTD + 560 kW Diesel UPS unit plus accessories (Exhaust silencer, front mounted radiator, starter batteries, day tank, Diesel control batteries)



The end of 2021 saw the delivery of the UBTD+ 1000 to site for installation and commissioning over a two-week period with the 2nd unit scheduled for installation and commissioning in June 2022.

CHALLENGES IN IMPLEMENTATION

Success for any uninterruptible power project that involves deployment in a live environment, and which involves multiple stakeholders and operations teams requires a combination of expertise, close collaboration, and trust.

Toward the end of 2021 Piller delivered the UBTD+ 1000 to site for installation. Following two weeks of commissioning the unit was ready to be used in line with the client needs and project schedule.

An airfield does not shut down during a change process. This means all people and companies involved had to work in partnership in order to deliver on the mission being executed in sometimes challenging circumstances – such as working through nights.

Piller worked closely with the RIX engineering team but also with third parties with responsibility for ventilation, fuel, and supply systems. For example, all civil works, underground storage tanks, acoustics were provided locally, as was mechanical and electrical installation.

Piller's reputation in the field is built on the experience and dedication of its people.

To the RIX team it was clear that Piller experts worked on UBTD+ UPS and Powerbridge flywheel technologies over decades.

The coordination between those involved setting up the DRUPS unit saw Piller technicians work and educate local RIX personnel on technical aspects of the unit operation. This provided the local team, who were unfamiliar with integrated DRUPS and flywheel back up, with confidence.

Working to tight time constraints the system was implemented, commissioned, and tested with no interruptions to any flights.

Piller continues to provide support to the RIX engineering team with the time, energy, and technical knowledge on the UBTD+ units and Powerbridge flywheel technology. "They always pick up the phone," says Pelite

THE RESULTS

From the outset the team worked closely with RIX to provide assurances about the technology, commitment, and engagement they could expect from Piller to ensure that all objectives were met.

Both RIX and Piller understood that project success required building a long-term partnership that would extend to ongoing maintenance and continued engagement that would guarantee a sound investment for the airport.

Pelite concludes: "We see it as a long-term partnership which will expand in the future. The ultimate benefit that RIX has gained from the project and its choice of solution is the technical reliability of the units on site. Achieving the lowest possible risk of failure of systems is exactly what is needed for us."



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