



2018 AWARDS FOR ENGINEERING EXCELLENCE

Award of Excellence

YVR Flywheel Energy Storage and Airfield Critical Power System



Consultant

WSP | Opus

Owner/Client

YVR - Vancouver International Airport

Category

Energy and Industry

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WSP-Opus was the prime consultant for the design and construction of a new critical back-up power system using innovative flywheel energy-storage technology for Vancouver International Airport's (YVR's) north airfield lighting system. The existing system was aged, had a 30 second blackout period at start-up during power outage events, was unreliable, and was expensive to operate and maintain.

Project objectives were:

- Provide a highly reliable safe system that provides continuous power under all conditions to the north airfield lighting system
- The solution must be environmentally sustainable
- Lighting system electrical-noise (harmonics) to upstream systems is minimized
- The system is easy to operate and maintain

The new system met all project objectives, using technology never used before at a commercial airport, but proven in other mission-critical applications. It includes a flywheel energy storage uninterruptible power supply (UPS) system, coupled with intelligent switchgear and high-efficiency generators. The project was designed and constructed around existing infrastructure to avoid any interruption to operations of the existing system during construction.

Significant planning and coordination ensured successful commissioning and switch-over to the new system without impact to airport operations.

Project achievements include:

- Elimination of runway lighting blackouts
- 78% (68,000L) annual reduction in system fuel consumption
- 90% (6.45 tonnes) reduction in system greenhouse gas emissions
- 100% elimination of lighting system electrical noise to upstream systems
- 73% operation and maintenance cost reduction.

The result is a highly reliable and efficient system exceeding project objectives.