



Vancouver International Airport (IATA: YVR) has installed a wiring pilot project from Netherlands-based Impleo Solutions preparatory to introducing continual operation of its dynamic stop bars.

This technology, which was introduced in November, is called Contactless Energy & Data Distribution (CEDD) and YVR says it is a first for a North American airport.

If the test CEDD system lives up to YVR's expectations, it will gradually expand CEDD to the rest of its 33 stop bars installed at taxiway/runway intersections and at right angles to the runway. They are a safeguard

against runway incursions. When turned on, a stop bar warns pilots to hold short at the edge of the runway until air traffic control turns it off, indicating that it is safe to proceed onto the runway. (Stop bars that are turned on and off in this way are referred to as dynamic stop bars.)

CEDD uses electromagnetic induction, by which current passes from wires to lamps without any direct contact between the copper wire and lamp. Because there is no exposed wire, YVR anticipates that CEDD will be less prone to failure due to, for example, moisture, than traditional wiring.

More importantly for the stop

bars, however, the communication with individual lamps in the CEDD system is expected to be less prone to interference than existing wiring, among other improvements.

Typically, stop bars are operated only in low-visibility conditions, but YVR wants to further enhance safety by having them on 24/7. "We want to go to 24/7 stop bars. We feel it is safer," says Mathew Levesque, Manager of Maintenance Services, YVR.

Bay Hill Contracting Ltd, located in Langley, British Columbia, installed CEDD for the stop bar at the intersection of the new Delta Yankee (DY) taxiway, added when YVR constructed a Runway End Safety



Area (RESA) on the South Airfield's runway end 26L, between 2015 and 2017. (see information box.) In addition to running 11 LED inset stop bar lights, CEDD runs 33 LED DY centreline lights.

Because the stop bar is part of the airfield's Surface Movement Guidance and Control System, there must be communication with individual lamps to monitor them. But, Mr Levesque explained: "Our traditional lamp communication uses individual unshielded power cables with multiple splice points. It is open to interference that causes reduced ability to communicate over [it]. The CEDD is a lot faster and reliable."

If this pilot project produces satisfactory results, YVR will run another CEDD trial on a stop bar on the North Airfield's Runway 08L/26R, in 2020, while it is building that runway's RESAs.

This is the performance that YVR is looking for from the CEDD pilot project: "We are going to measure this with the activation speed. We are looking for no hesitation between when the air traffic controller turns off the light [flips the switch] and the stop bar lights go off. We want all the lights to turn off at the same time," Mr Levesque noted.

With the current wiring, he added, "... even though they turn off very quickly, there is hesitation. It can be confusing."

While CEDD can be integrated with existing Airfield Lighting Control and Monitoring Systems (ALCMS), it did take some vendor teamwork to do the job, Levesque says. "The ALCMS came from Liberty, which was sold to ADB. So people from Impleo worked with ADB to integrate the stop bars in to the Liberty ALCMS. The graphics



in the control tower have to show the CEDD-controlled lights. We had to get the two systems to co-operate."

Beyond how CEDD may improve the communication between the airport's stop bar lamps, the technology, says YVR, offers another improvement that the airport, as a big user of LED lighting, may wish to exploit. While switching to LEDs does reduce electrical consumption, the full electricity savings potential of LEDs is not obtained when they are simply substituted for incandescent or

halogen lamps, for example.

Mr Levesque concluded: "CEDD uses a parallel voltage system instead of the traditional 6.6-amp constant current system. Voltage-driven systems do not require isolation transformers, so true power savings can be seen by using LED fixtures. The airfield lighting industry is looking for a more efficient alternative to the traditional constant current system. YVR is testing CEDD now [for possible] use in future projects. Power reduction is a big bonus."

Of RESAs and Lights

In addition to the Contactless Energy & Data Distribution system pilot project, Vancouver International Airport (YVR) has been busy logging other firsts over the past couple of years. It is also part-way through a five-year project to build Runway End Safety Areas (RESAs) on all six of its runway ends. YVR declared Phase 1 completed last autumn, with 984ft (300m)-long RESAs built on both ends of Runway 08R/26L. A RESA of the same size was built on the 13 end of Runway 13/31 and a 492ft (150m) RESA was constructed at the opposite end.

Jacob Bros Construction was the prime contractor for the Phase 1 work. Mississauga, Ontario-based Hatch Ltd was the design consultant.

The RESAs all exceed the recommended International Civil Aviation Organisation standard and meet its risk level of no more than 0.45 per 10 million excursions going beyond the RESAs.

They will also exceed the first-ever required standard for RESAs in Canada, which Transport Canada is expected to issue in 2019. There will be two-year compliance deadline for airports with Code 3 and Code 4 runways.

In March 2018 YVR was due to begin work on the RESAs, also 984ft long, for both ends of Runway 08L/26R.

While working on the South Airfield RESAs, YVR took the opportunity to do a 98ft (30m) wide

overlay on the entire length of the centre keel of 08R/26L. "We cored down each inset light. We removed the riser rings from each base can, put in blank plates, refilled with asphalt. We ground down right over where the lights were – 100 metres at a time. We then paved over. We came back with the coring machine, bored down, removed the blank plates, installed new risers and reinstalled the lamps," explained Mathew Levesque, Manager of Maintenance Services, YVR.

Building the 08R and 26L RESAs required the removal of some of the approach lighting. This was a major task as the 08R end, for example, required the installation of two miles of electrical ducts. This work was carried out by lighting subcontractor Bay Hill Contracting, based in Surrey, British Columbia.

Of particular note, however, was the replacement of the 26L approach lamps with LEDs from HELLA; a few months later the 26R approach lamps were also switched to LED.

Using LEDs for approach lighting is quite recent. It was only in January 2016 that St John's International Airport, on Canada's east coast, declared its new LED approach lighting system operational and said it was a first for any airport in the world.

Since the construction of the 26L RESA also included a new taxiway – designated Delta Yankee – Bay Hill also installed 354 LED taxiway lights.