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VYKON™ Energy

Case Study

Putrajaya Local Authority selects Vykon® by Tridium® to integrate critical system in massive tunnel project.

Department of Ministry building at Putrajaya

Approximately 25 kilometers south of Kuala Lumpur (the capital of Malaysia) is Putrajaya, a planned city being built according to a series of comprehensive policies and guidelines for land use, transportation systems, utilities, housing, information technology, parks, and other public amenities. In 1999, Perbadanan Putrajaya, the Local Authority of Putrajaya, signed an agreement with local utility companies to develop a Common Utilities Trench (CUT) to house gas pipelines, telecommunications cables, and water and sewer infrastructure. The purpose of the tunnel is to provide the utility companies access to their systems for maintenance and upgrade work without disturbing traffic or the aesthetics of the surrounding area.

The tunnel spans 11.4 kilometers (7.1 miles) and has access points located throughout for utility personnel to enter. Due to the size of the tunnel, Putrajaya officials wanted to automate and integrate the mechanical and electrical systems so lighting, ventilation, and other systems could be optimized.

Safety was also a huge concern since the tunnel would have limited exits and finite levels of oxygen, exposing workers to potentially dangerous conditions. Oxygen, methane, and temperature within the tunnel needed to be monitored carefully and real-time alarms were critical to protect workers.

Furthermore, the local utilities involved with the project were concerned with potential sabotage, as the systems in the tunnel were critical to their operations and public safety. Putrajaya faced hefty security requirements and needed access cards and security cameras to be integrated into the automated electrical systems.

Finally, Putrajaya officials were concerned about fire in the tunnel since access and equipment to fight fires in the space would be limited. Early detection and notification of smoke, carbon monoxide, heat, and fire could be critical in saving lives.

About Putrajaya Common Utilities Trench

- 11.4 kilometers common trench to house power and telecommunication cables as well as gas, portable water, and chiller water pipes
- Enables utility companies to perform maintenance and upgrade work without inconveniencing the public
- Financed by joint venture of five local utility companies

Project Requirements

- All mechanical and electrical systems throughout the tunnel were to be automated
- Security systems including cameras, alarm verification, and spy activities were to be computerized
- Oxygen, methane, and temperature were among the things being monitored with real-time notification

Vykon Provided

- Integration of electrical services, lighting, ventilation, gas, and drainage systems
- Web-based access with real-time capabilities
- Reliable distributed architecture

Benefits for the Tunnel System

- Safe working environment with complex monitoring and automation system integration
- Engineering savings as many tasks become web-enabled

• Powered by niagara FRAMEWORK™

Putrajaya implements Vykon by Tridium to automate critical systems at the Common Utilities Tunnel.

"We were able to integrate numerous systems into a common platform but the real value was in the distributed, real-time capabilities of the Tridium Solution".

Loong Fuat – Metronic Joint Venture

The Challenge

Since water, telecommunications, and gas services to be housed in the tunnel were critical utilities and potential targets of sabotage, each needed to be monitored and protected. Safety was also a priority and it was imperative that Putrajaya have an absolutely reliable system with redundancy and a distributed architecture.

City officials wanted the security systems to be integrated with the mechanical and electrical systems so lights would be illuminated, cameras activated, and alarms dispatched when the security system detected an intruder. Likewise, if the fire and security systems detected fire, smoke, or high methane levels, officials wanted the ventilation systems to exhaust the smoke and the security system to release doors to avert catastrophe.

Access to all systems in the tunnel from anywhere was essential as fire marshals, local authorities, tunnel operators, and utility companies each needed real-time alarms and access to various areas and systems. Integrating these systems to provide greater reliability and secure anytime, anywhere access presented a difficult challenge.

The Solution

Perbadanan Putrajaya selected Metronic Engineering Sdn, Bhd. ("Metronics"), one of the leading Intelligent Building Management Systems companies in Malaysia to undertake the CUT Project. Metronics chose *Vykon® by Tridium®*, supplied by ITG Worldwide, as the technology to use for the project. By integrating all of the systems into a unified web-based platform, the Tridium solution enabled Putrajaya to consolidate and optimize operations of the tunnel systems allowing City authorities to monitor and make necessary changes through a standard web browser, thereby eliminating the need for a multitude of individual proprietary user interfaces.

The Vykon System provided Putrajaya with a comprehensive solution that integrates all critical systems including lighting, ventilation, fire and safety, and security. The system enables direct communication between the diverse systems allowing M2M (man-to-machine and machine-to-machine) communications. Upon receiving an alarm, the Vykon system automatically alerts operators to the problem and begins taking necessary actions that may include activating sounders in appropriate zones, starting ventilation in extraction mode, and displaying the fire location camera video image on the operator console.

Finally, Vykon's unique distributed architecture addresses the concern of system reliability. Since Vykon consists of distributed computers located throughout the facility, issues related with centralized server architectures was eliminated.

The Benefits

By installing the Tridium solution, Metronics was able to help Putrajaya minimize maintenance and operational costs of the tunnel through automation of mechanical and electrical systems and accessibility of these systems through any standard web browser. In addition, Putrajaya was able to provide a safe work environment in a challenging setting.

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