Case Study

core controls
An ipsum Group Company

Brynglas Control System
Core Controls Solutions

Overview of works

Located on the M4 at Newport, South Wales, the Brynglas Tunnel is a major transport link for the resilience of Wales, the UK and in a wider sense Europe, as it sits on the E30 Euro-Route. The 360m twin bore tunnel first opened in 1967 after a 3-year construction period and has been in operation continuously ever since. At peak periods it carries approximately 80,000 vehicles per day.

Following continuous use and the progressive increase in traffic volumes, the structures and tunnel's condition were evaluated as poor with many assets reaching the end of their operational life. Furthermore, the tunnel experienced a serious lorry fire in the we bound bore during July 2011, where a 215m section of the original internal and exit zone lighting was de royed. As a result, a temporary lighting sy em and a 50mph speed restriction were imposed to maintain traffic flows and transport resilience.

In 2015 a project was commissioned to refurbish the tunnel which was awarded to Costain who were to deliver the project in partnership with SPIE Industrial Services and Core Controls. This project began in earnest during January 2016 with the aim of site completion by the end of April 2018.

The scope of works included

- Provision of a resilient, fibre optic network for the tunnel.
- Integration of the tunnel network into the wider Welsh Government network.
- Provision of the PLC/ SCADA based Integrated Tunnel Control Sy em (ITCS).
- Integration with the Welsh Governments COBS system.
- Provision of the signage system known as the In-Tunnel Traffic Signalling system (ITTS).

Our solution

The new Integrated Tunnel Control System provides the integration of all the tunnel subsystems into a single holistic control system with a simple and intuitive user interface. The ITCS incorporates a hot-standby Schneider M580 PLC system with remote I/O and external PLC processors for local functionality. The distributed PLC architecture provides all functionality including information exchange between other subsystems providing a highly resilient system. The tunnel SCADA system platform is based on Iconics Genisis64, a proven so ware suite providing unparalleled performance and feature-rich visualisation tools. The hot/standby configuration provides alarm handling, reporting,

Our solution

trending and historical data management, providing a powerful management tool.

The CCTV, VAID and PAVA systems were each designed to be fully redundant, meaning up to 50% of VAID cameras or PA speaker failures would maintain the requirements of the project performance specifications. The CCTV system incorporates Bosch MIC cameras which have both standard and thermal lenses built into a single housing. The VAID system comprises of a FLIR TrafiBot system with image processing built into each camera, further innovation was provided using thermal images with the VAID system to cover the portal areas providing resilience again sunlight causing false alarms. The PAVA system is a Bosch Praesideo based system with tunnel specific horn speakers every 50m through out the tunnel.

Given the srategic importance of the tunnel location and the impact closures would have on the travelling public the challenge was set to upgrade the system while returning the tunnel to service every day. This coupled with a six-hour working window each night required close coordination with the client, Costain, Spie and other contractors to ensure asset availability for the travelling public each morning. The client now has a future-proof tunnel with complete asset visibility, resilient systems and effective situational awareness.

The scope of works included

- CCTV system that incorporates thermal imaging for use in poor visibility.
- Provision of the tunnel Video-Incident Detection system (VAID).
- Provision of the Public Address/Voice Alarm (PAVA) system.
- Provision of the tunnel emergency telephones and their integration into the Welsh Government's Cisco telephone system.
- Integration of the Linear Heat Detection system.
- Integration with the Philips tunnel lighting system.

80,000
daily road users

360m
twin bore tunnel

Night time
programme