Case Study: **Hinkley Point C**

Five years on: Telent hits major design phase milestone for Hinkley Point C

Situated in Somerset, Hinkley Point C (HPC) is the first nuclear reactor to be built in the UK in almost three decades. The build of HPC is currently the largest construction site in Europe covering an area equivalent to 325 football pitches, with around 12,000 workers on site.

In 2019, Telent was awarded the multi-million-pound contract by EDF NNB to design, install and commission a multi-faceted communications and IT system for HPC. The communications network that will connect everyone and everything within the nuclear power plant is the epitome of mission-critical. Network downtime, even for a short period of time spells productivity loss and potential safety issues for workers and those in surrounding areas.

HPC will provide 7% of the UK's electricity for the next 60 years and deliver a low-carbon energy source to six million homes. Currently in the UK, nuclear energy powers almost 20% of its national grid. As the use of fossil fuels continues to decrease, nuclear power plants such as HPC, will play an even more pivotal role as the UK seeks to achieve net zero carbon emissions by 2050.

Designing a "best-of-breed" solution

With a comprehensive portfolio of "best-of-breed" networking and technology solutions, Telent was selected to design, install and commission the communications and IT system for the entire site, spanning across multiple different technologies. This includes a dual data centre infrastructure and both wireless and wired communications networks to connect approximately 150 buildings.

As part of the project, Telent will deliver a fully integrated and interlinked communications network that is connected via satellite to the nuclear power station's wider network. The network consists of public address alarm systems, multi-service on-site radio, wireless local networking, telephony, CCTV and emergency power backup for critical systems. The solution is being delivered under the exacting demands of a nuclear power plant in terms of technologies, quality and processes.

For efficient communications and announcements to the entire plant, the local area network enables a secure wireless connection and ethernet services for the communication between on-site staff via mobile phones, laptops and other devices. The network infrastructure supports a unified communications and messaging platform consisting of microphones, loudspeakers, alarms and visual TV screens that support a consistent set of voice, video and messaging capabilities. The site wide IP network requires over 6,000km of cabling and provides around 6,000 data points.

To ensure communications can be maintained in even the worst-case scenario of a total power outage, a system of sound powered telephones would be deployed. A number of specialist antennas for radio services have been designed for mission-critical communications through the existing alarm system and to help contact local emergency services in the event of an incident.

Telent has also designed a site wide "Process And Production" CCTV network to identify potential hazards during operations and report them through the alarm system.

Realising the design

The solution must comply with around 3,000 complex requirements, including rigorous standards set by the Office for Nuclear Regulation (ONR). Telent has now passed the major milestone for the solution high-level design, meaning its solutions have been approved by the customer and proven to be suitable for the most challenging of environments. This includes testing to ensure the equipment can withstand scenarios such as a major earthquake or a direct aeroplane crash and remain operational.

To facilitate this complex installation, the Telent Hinkley Point C team needed to produce 70 batches of building designs for the construction project. Telent's network designs have been approved as fully compliant with the structural requirements of HPC, meaning that the active equipment as selected by Telent is fit-for-purpose. Currently, 50 batches of building designs have been released to Telent for the team to work on.

Getting ready for deployment

The building and testing of Telent's networking solutions prior to deployment, takes place locally to HPC in Telent's Bridgwater facility, the operational hub of the project. The Proof-of-concept reference model was set up in Bridgwater. Using an IBM® Engineering Requirements Management DOORS tool, the team was able to perform audit tracking in real-time, providing visibility into how the designs were progressing. A key enabler for Telent realising its physical layout designs was the innovation of 3D CAD, which was used for all batch installation designs.

Telent helped suppliers learn more about the communication and IT solution by organising a "suppliers' insight" day at its Bridgwater location to educate them on the complexity of the HPC project. This included a visit to the site for a deeper understanding of the scale of the project and what Telent plans to achieve with their help.