Nuclear digital technologies

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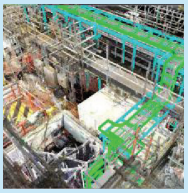
Nuclear digital technology	Benefits
 **3d Laser scanning and photogrammetry** Faster than traditional surveying methods and collects more information for complete design and engineering	› **Design:** Quickly collect data and produce a detailed model to develop designs from anywhere in the world. Our process removes the risk of relying upon inaccurate legacy site plans and drawings. › **Construction:** Design changes or sub-contractor designs can be quickly checked against the base model– only visit site once to gather data. › **Operation:** Reality capture can be used to monitor changes over the asset life
 **Drone Surveys** Specializing in aerial data capture from satellites, manned aircraft and drones, our geomatics team captures reality to bring the site to the client's desktop at survey grade accuracy.	› A faster, safer more reliable method for carrying out land surveys › Ultra-High-Resolution Imagery gives un-paralleled insight into visual condition surveys › Full site aerial imagery means that additional information can be captured from the desk instead of returning to site › In-house analysis and data processing capability to deliver engineering quality 3d models
 **Information Systems** We have a range of solutions to support every stage of the project lifecycle, from engineering through to operations and decommissioning.	› **TRAK**—Project Information Management for major work projects and programmes › **ACCIS**—SCADA based safety system for high hazard industries › **PSPs**—Helps plan and manage maintenance activities in safety critical environments on tablets or laptops at the workface › **iCAPs**—Library of decommissioning cost estimated and program information for nuclear plants to produce site specific estimates
 **Project Data Hubs** Our project data hub approach captures reality and 3d model information to provide a visual platform for storage and information management.	› Flexible, maintainable, accurate and a permanent record providing an environment for better stakeholder engagement › Fewer assumptions for design and physical works pricing › Fewer site visits throughout the project lifecycle › Fewer Technical Queries (TQs) and improved design and delivery co-ordination activities › Better activity planning by conducting them virtually prior to on-site works › It's flexible, maintainable, accurate and a permanent record providing an environment for better stakeholder engagement.
 **De-risked design delivery** By integrating a range of digital technologies into the entire project workflow, we can de-risk design delivery and better maintain schedule and budget.	› Laser scanning to captures a single source of truth for current site configuration › 3d designs developed from the outset results in greater cost certainty › Paperless manufacture through model-based definition, reduces cost and program for procurement and manufacture › Enabling modular design and offsite manufacture can reduce program installation
 **Virtual Reality** Immersive visualization technology enhances engineering design, delivery and operations by providing spatial context to data and assets.	› Increases efficiency and reduces cost across the lifecycle of a facility › Identifies clashes during design › Delivering more effective training and planning activities › Simulates dismantling and demolition When used in combination with BIM and 4D (scheduling), 5D (cost) and 6D (performance) data, this holistic view takes the art of de-risking activities, for both people and the bottom line, to a whole new level.
 **Model Based Definition** Enables contractors and fabricators to deliver designs directly from 3D models avoiding 2D drawing production and model replication.	› Designers issue 3d model to supply chain, with specifications linked to the file; this avoids the error trap associated with manual data transfer › Working with the wider supply chain de-risks designs and reduces project program › Proven process with high levels of assurance and verification in support of safe operations

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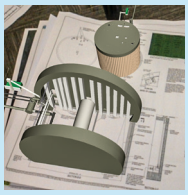
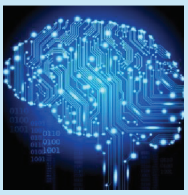
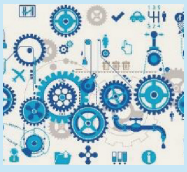
 **Robotics** Mature and proven technology for systems integration and solutions delivery.	› Safe solutions that integrate off-the-shelf equipment in a nuclear setting › Digital engineering methods (3d laser scanning, 3d design) provides certainty of existing site conditions to safely integrate robotics into existing facilities › Robotics benefits operator safety and program efficiency
 **Asset Management & Operations** The vision is to enable digital twins for whole lifecycle asset management solutions from design through to decommissioning.	› We support with developing and delivering the three key pillars of a digital asset management strategy › Enterprise Asset Management—working with systems integrators and users to provide domain expertise to configure new and existing systems › Asset Performance Management—data collection and aggregation from enterprise asset management systems enables reliability centered maintenance, predictive analytics and condition-based maintenance › Asset Investment Planning—data to support investment strategies and long-term capital planning
 **3d printing** Rapid solutions prototyping is enabled by integrating 3d printing capability in the project workflow.	› A natural extension of our digital engineering capabilities and enabled by 3d laser scanning and metrology experience › Parts can be printed and tested for fit on site prior to commissioning the final item for manufacture by traditional or 3d printed means › Provide project stakeholders a physical model of the engineering solution before it's built or manufactured › Reverse engineer obsolete or consumable parts and quickly produce bespoke 3d printed replacements
 **Augmented Reality** Overlay designs and modifications on-site prior to execution.	› On-site design review designs provide workers complete understanding of challenges and constraints › Enables better planning and identify key tools and resources to execute the project › Identifies hazard information, such as radiological sources or obstructions › Link in design specifications and method statements to reduce paper required.
 **Data analytics** Provides engineering insights using data science, artificial intelligence and machine learning to increase asset life and reduce operational costs.	› Agile development methodology to implement selected ideas with a combination of process and technology; domain expertise, advanced neural networks, open source software and cloud deployment › Cross functional teams comprising engineers, data scientists, data architects and developers › Idea-to-scale methodology to turn innovative ideas to deployable solutions
 **Robotic Process Automation** Automating data transfer to maximise efficiency and throughput by increasing staff productivity and reducing process timelines.	› We map current workflows to identify manual and repetitive tasks and their interfaces › Software 'robots' are developed to automate these tasks and interfaces › Automated workflows are integrated into existing systems › We provide ongoing support and review to drive operational efficiency
 **Cyber Security** World-class cyber security team that specializes in securing data and critical infrastructure.	› Developed methodologies that prevent and manage cyber threats › Identify unknown security vulnerabilities, weaknesses and risks in Information Technology (IT), Operational Technology (OT) and Industry Control Systems (ICS). › Robust security and resiliency providing cost-effective business or service continuity for sustained revenue

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