

Great North Museum: Hancock



The Client

The Great North Museum: Hancock brings together the North East's premier collections of archaeology, natural history, geology and world cultures under one roof. It incorporates collections from the original Hancock Museum and Newcastle University's former Museum of Antiquities and the Shefton Museum.

Following a period of planning, an ambitious expansion and renovation of the Hancock Museum (as it was formerly known) was fixed on by the museum's management team. To support this they applied for and gained the largest ever Heritage Lottery Fund grant of £8.75m in late 2005. In addition, generous funding was received from a wide range of supporters including the European Regional Development Fund, One North East, the North East's regional development authority, Newcastle University, Newcastle City Council, TyneWear partnership, Northern Rock Foundation, Department for Culture Media and Sport, Garfield Weston Foundation, Clore Duffield Foundation and the DCMS/Wolfson Foundation Museums and Galleries Improvement Fund.

With this backing, the total £26m project involving the redevelopment of the Hancock Museum, the management of the Hatton Gallery and the development of an off-site storage and resource centre began in earnest in April 2006 and took just over three years to complete. Transforming this museum, which was, formerly little known outside the North East; into one of the UK's premier visitor attractions was an understandably massive project.

The museum building itself nearly doubled in size and work included comprehensive renovation and modernisation as little had been done to the building since it originally opened in 1884 with the backing of the natural historians John and Albany Hancock. In preparation for the work, over 500,000 objects were moved out of the Hancock Museum building to temporary storage while the renovations were carried out and a new off-site storage facility, the Great North Museum: Resource Centre, was developed in the Discovery Museum to the south of Newcastle.

Once the build and fit out was completed, some 3,500 hand-picked objects from the collections were brought in. The rebranded Great North Museum: Hancock was opened to the public on 23rd May 2009 and officially opened by HM Queen Elizabeth II accompanied by the Duke of Edinburgh in November 2009.

The transformation has proved a great success. Visitor numbers in 2005, its final year before work began, were 75,000 whereas in the first 18-months of operation the new museum saw over 1.1m visitors and 850,553 in the first 12-months of opening. Today it is recognised as one of the top 20 free visitor attractions in Britain and the top attraction in the North East.

The Challenge

Like most state-of-the-art museums today the Great North Museum: Hancock is built to a very open plan design, encouraging maximum interactivity and learning opportunities. Many of the artefacts are not in cases and there are no barriers preventing visitors getting close to exhibits. With the significant increase of visitors; targets of receiving at least 30,000 educational contacts per year; and the total value of the permanent exhibits and equipment in the new museum exceeding £30m; the new CCTV

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system needed to be designed for people management, visitor safety as well as for security of high value exhibits.

With this in mind the Great North Museum Project Manager and Senior Manager for the Great North Museum and Discovery Museum, Steve McLean, worked closely with the Security Manager of Newcastle University, George Westwater and the University's preferred CCTV systems designer and installer 2020 Vision, to design an appropriate solution. The team also took advice from both the British Museum and Natural History Museum's security advisers in order to ensure that the entire museum was designed with safety and security in mind.

It was important to meet the very highest security stipulations so that the new museum would also be able to house high value visiting exhibitions including objects from the British Museum and other National Museums and Galleries.

To this end, the building was designed to be able to lock down and secure specific zones and galleries relevant to the building's usage through a series of highly secure ceiling-to-floor metal shutters. For example, delivery of visiting exhibitions is conducted at the rear of the building where there are multiple layers of security from retractable bollards to code and key-locked doors, all covered by CCTV cameras.

It is important that the building remains fully secure even in potentially vulnerable scenarios like visiting-exhibition movement or evening corporate events. One major advantage of securing the site to the highest specification is that little upgrade work is likely in the near future and there is a significant potential to reduce insurance premiums because it is specified to such a high level.

Data Protection Act 1998 requirements prevented museum staff from viewing recorded CCTV images so all proactive monitoring and analysis of recorded images was to be carried out centrally at Newcastle University's 24-hour manned CCTV Security Control Room some 300 metres away on the University's main campus, which is already registered with the Data Protection Commissioner to monitor the University's main campus on which the museum sits. This meant that the museum's security system needed to integrate tightly with the University's existing security infrastructure.

On the museum site itself, the CCTV system was to be used principally for access control purposes so that, for example, museum staff could visually verify a school party before letting them in at a dedicated schools entrance at the rear of the building.

Cameras had to be positioned sympathetically so as not to draw attention. It is possible to view live images via three different dedicated CCTV monitors displaying four cameras in quad view, placed at the reception desk of the museum and towards the rear in an administration office. Museum staff would need to request recorded images from the central CCTV Security Control Room if they suspected a security or safety breach.

Although the museum has no dedicated security staff on duty during the hours of opening it has a guaranteed team of nine staff in the building who all are trained to carry out security checks. They also carry radios with silent panic alarm buttons linked to the University's security team. A further six fixed silent panic alarms send alerts through to Northumbria Police in case of a threat. In addition, extra staff deployed for visiting exhibitions are issued with radios and personal panic alarms, also routed directly to the police. A RFID tag system is used on the books in the museum library, which holds several hundred very valuable books, ensuring that this rare collection of books can be viewed and studied on the premises by the general public.

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Dr Sarah Glynn, Museum Manager, Great North Museum: Hancock, said:

“Before the project there was no public access to areas such as the museum’s library of rare books. The great thing about our new security system is that it enables us to make the museum collections much more accessible to our visitors than ever before.

“It helps us to make the artefacts highly accessible. The new security technology, including Instek’s DVRs and display processors, enables us to provide access to all and to create a safe environment for our collections, visitors and staff.”

The Specification

As part of the ambitious renovation of Great North Museum: Hancock, 2020 Vision was commissioned to install all CCTV cameras and a dedicated collector point or ‘node’ for the museums’ CCTV surveillance images. The node consists of a 48-channel Honeywell Max1000 camera control matrix for switching between cameras and controlling their movement. This is networked with Instek DVRs, video processors, a video distribution amplifier along with a fibre optic patch panel and fibre optic transmission equipment, all housed in a 19 inch 42U 600x800 lockable equipment rack.

This node collects images from one newly installed JVC TK-C1460BE PTZ Camera fixed onto an eight metre tubular steel column and seven Computar HG2Z4516FCS fixed cameras to cover the entrances, exits and car parking space outside the building; and a further 36 Honeywell HCGC48X fixed dome cameras were also deployed internally to cover all key exhibits – a total of 44 new cameras in all were now connected to the new system.

All cameras were fitted with powerful half inch format lenses with variable focal length of 12-240mm providing a zoom ratio of 20:1, capable of identifying a person with total accuracy at a distance of up to 177 metres and detect movement up to 800 metres from the camera. To supplement existing white lighting fitted by the M&E contractor, 2020 Vision also fitted twin infrared illuminators to shed additional light on areas of shadow. All cameras were housed in IP65-rated enclosures complete with sunshield and anti-condensation heaters. All housings were also fitted with anti-tamper devices.

All CCTV cameras were fed into three Instek DVR-16F-3U Digital Video Recorders (DVRs), providing video recording and management for 16-channels at up to 25 frames per second (fps), each at 4CIF resolution. Instek Command Center Lite software was installed on a local PC, then networked to all the DVRs. This software ensures that the University’s Control Room can select and control cameras from there in case of suspected incidents or in order to track suspicious individuals around the grounds of the museum.

2020 Vision supplied a total of six high-capacity Hard Disk Drives (HDD) to store all images for a maximum of 31 days. A Veracity TIMENET GPS-based NTP Time Server was installed to ensure that all recordings are accurately time-stamped for evidential purposes. TIMENET integrates GPS receiver and master NTP (Network Time Protocol) clock server into a single device, which is directly connected to the network. Live images from four cameras can be viewed simultaneously on Honeywell HMLCD17E 17 inch monitors using American Dynamics ADQUD87-1 multi-picture colour quad software.

The node is linked back to the control room via an eight-core fibre optic backbone. Two fibres provide a 10-base 10/100 LAN network for retrieval of recorded images from the node and is required for access control and intruder alarm signals, voice over IP for help points and public address. Each of the other pairs of fibres is used to create up to five real-time peer-to-peer video channels and an RS232 data channel for control of the collector point slave control system for the master matrix. Coaxial cabling is used to all internal and external cameras and then fibre optics from the new node which is



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set up to deliver real-time and recorded images at 25 fps and 4CIF resolution back to the central control room.

The Solution

2020 Vision, as Newcastle University's security contractor for more than 10 years, was the natural choice for the CCTV system implementation at Great North Museum: Hancock which is based at the edge of the University's City campus. The CCTV system recommended by 2020 Vision was fully compliant with the University Security Department standard CCTV system requirements and was 'hard-wired' into the University's existing CCTV infrastructure and back to the 24-hour manned CCTV Security Control Room on the main City campus.

Great North Museum: Hancock engaged 2020 Vision to provide a comprehensive CCTV solution linked into Newcastle University's already mature security infrastructure to optimise the use of the University's control room and security team. By adopting this approach the museum avoided having to employ its own dedicated security guards which in turn helped justify funding of the comprehensive security system that they needed to enable it to offer optimal accessibility and interactivity to visitors.

2020 Vision extended its node or distributed 'collector point' approach already used to secure the large city centre campus of Newcastle University. This all made good sense because of the location of the museum within 300 metres of the University's CCTV Control Room.



2020 Vision worked with its partner Veracity UK which is a development partner of Instek Digital, the manufacturer of high-performance hybrid DVRs used to record surveillance images on this site.

CCTV is used externally to monitor the car park and entrances to the museum. This is important because of its location within the university campus and to ensure that there is no unauthorised entry or exit from the building. All five entrances are covered by fixed CCTV cameras so that there is a visual record of all entry and exit, which identifies specific people. It has already been used to identify and monitor a known offender who came through the museum. In these sorts of instances recordings can be burnt onto DVD or CD-Rom by the central CCTV Security Control Room and sent onto the police as required. All windows were fitted with contact alarms linked to a building-wide intruder alarm system. The entire CCTV system fitted by 2020 Vision cost £108,800 to purchase and install.

The Results



Dr Sarah Glynn, museum manager, Great North Museum: Hancock, summarised:

“The new surveillance system has performed beyond expectation. This investment has been an important enabler of modernisation of this museum. It simply would not have been possible to give total accessibility to many priceless artefacts and books without the security coverage that 2020 Vision’s CCTV system provided.

“The museum has had no major security problems since its opening in May 2009 which is proof in itself that the system has worked and also enables us to host high-value visiting exhibitions and more corporate events than would otherwise have been possible.”

The Future

2020 Vision has been able to design a system, which although CCTV-based today is designed for migration to IP over time. The Instek Digital DVRs, supplied by 2020 Vision’s valued partner Veracity, are designed to take 16-analogue channels and 16 IP-channels in parallel.

Peter Houlis, managing director, 2020 Vision Technology, added:

“Deployment of Instek’s hybrid DVRs here has created a system which is right for the museum today but is also future-proofed – ready to exploit the benefits offered by the latest IP-based technologies as and when they become appropriate at the museum.

“We rely on relationships with key technology partners, none more so than Veracity. Veracity is not only the supplier of Instek DVRs and its own complementary transmission and storage products, but has immense know-how which enables us to design and implement highly reliable yet flexible analogue-IP hybrid and pure IP-Surveillance systems to meet the needs of a wide range of customers.”

For example, Veracity and 2020 Vision together created a fully integrated surveillance and access control system at the new Bede Academy school in 2009. This installation won the highest accolade in the UK professional security installation world: the Security Excellence Awards’ ‘Best Integrated Security Solution of the Year’.