

Thomas Jefferson National Accelerator

Continuum™ Provides Safety Training Verification



PROJECT AT A GLANCE

Project Type: Security, Safety

Location: Newport News, Virginia, USA

Number of Buildings: 110+

Total Area: 555,000 sq. ft. (51,556 m²)

Applications:

- Access control
- Security management
- Training record verification
- Fire alarm monitoring
- Photo badging
- Automatic pager notification

Third-party Equipment and/or Drivers:

- Siemens Pyrotronics Fire Alarm Control Panels
- Pre-existing personnel and training database

Number of Controlled Doors: 65 total, 31 with card readers

Number of Controlled Vehicle Gates: 4

Number of Cardholders: 1,988

Andover Continuum Equipment Installed:

- 20 – Network Controllers
- 6 – CyberStation™ Workstations
- 90 – I/O Modules

Network:

Fiber Optic WAN (Ethernet TCP/IP)

TAC Partner:

Actcom Security Solutions



Scientists from across the country and around the world visit the Thomas Jefferson National Accelerator Facility to advance mankind's understanding of the atom's nucleus – not only to research the make up of matter itself, but how to better produce new and stronger materials for the future. Funded by the U.S. Department of Energy (DOE), Jefferson Lab (JLab) is managed by a consortium of 53 universities called the Southeastern Universities Research Association, or SURA, under contract by DOE.

JLab's unique Continuous Electron Beam Accelerator is a machine in a racetrack-shaped concrete tunnel 7/8 of a mile long and 25 feet underground. It uses superconducting technology to deliver a continuous beam of electrons to targets, such as hydrogen, carbon, gold, or lead. When the beam collides with its target in one of the three large, hill-like experimental halls, the particles scatter. By studying the speed, direction, and energy of the scattered particles, scientists learn more about how the nucleus is put together. Each year over 1,550 scientists visit JLab, booking accelerator time years in advance.

In addition to particle physics, JLab works to educate the next generation of scientists and to partner with industry in utilizing JLab's advanced technologies.

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David Kausch
Fire Protection Engineer
JLab

Searching for a Solution for Access Control/Training Verification

One of several accelerators in the U.S., JLab, with 82 buildings situated on 210 acres, is located in Newport News, Virginia. The complex is comprised of the accelerator site, the administration campus, and a 44-unit residential facility for the visiting experimenters. A SURA staff of 550 manages the facility and the scientific program, and more than 1800 badge holders have daily access to the facilities.

The need for an access control system at JLab to protect everyone on site, to safeguard its very expensive assets, and to control access to areas where safety hazards exist, is no surprise. What is unique at JLab is that the predominant driving force behind the installation of an access control system was to automate the mandated DOE requirement that safety training records are verified before granting any personnel access to the accelerator site.

Safety Training – the Key that Unlocks . . .

In a research facility of this type, there are two main hazards – radiation and oxygen deficiency. To prepare everyone to work in this environment, JLab requires all personnel to take safety-training classes. Four different levels of radiation safety training are offered, based on the access area and job to be accomplished, and must be repeated every two years. For example, any personnel requiring access to the accelerator site must be trained at the lowest level, General Employee Radiation Training (GERT), along with a general Orientation Class.

Oxygen Deficiency Hazard (ODH) training, when required, must also be repeated every two years. For access into Experimental Halls A, B, or C, all personnel must have completed the Orientation Class, at least the second level of radiation, plus ODH. Each employee is responsible for scheduling and retaking classes before expiration occurs, and oftentimes, training and testing are available on-line.

With these needs in mind, JLab administration searched for a system that could both control access and tie into their existing Human Resources/training database, which resides on their Central Information System, or CIS.



Nobium Cavity Pair Assembly in Clean Room

JLab Selects Continuum

In 1998, JLab put out a request for a comprehensive Central Alarm Notification System, or CANS. The spec called for a single front-end system that could not only tie their access control in with their existing CIS, but also integrate their existing fire alarm panels, CCTV, building automation system, and an array of alarm monitoring systems that had evolved over JLab’s 10-year construction period. Solicitation packages were sent to representatives of every systems integrator that claimed to have any experience with fire protection and security. Ten manufacturers were represented at the initial site visit.

Actcom Security Solutions of Virginia Beach, Virginia, a local TAC® Partner, bid on the project, offering the Andover Continuum system as the solution to their integrated security management needs. “What was initially very appealing to JLab,” according to Tony Damalas, Vice President/CTO of Actcom, “was the fact that, in addition to access control, the Continuum system could integrate and centrally control their

four Siemens Pyrotronics MXL analog fire alarm panels, as well as interface to the 16 conventional fire alarm panels using Andover Plain English™ drivers. This unique, two-way fire panel interface ultimately received a UL 864 site listing."

Powerful Two-way Communications between HR and Access System

David Kausch, Fire Protection Engineer for JLab, says the facility presented a very tight spec for potential vendors to meet. "We were looking for an integrated system to monitor all existing Fire Alarm Control Units, a high level interface with addressable FACPs (Fire Alarm Control Panels), and an access control system that could link to our CIS system. Specifically, we needed a data interface between JLab's central HR database and the access control database."

"Using their Plain English programming language," says Kausch, "TAC was able to provide us with an interactive software interface between the two systems that would update six times a day – importing cardholder information and training information from our HR database and distributing cardholder access rights to Continuum's card readers ... and all totally automated with no operator intervention required. Now we know that each person using this DOE facility has satisfied the various training requirements, and the two-way communications between the two systems makes meeting this DOE mandate much simpler!"

In addition, notes Kausch, the Lab's population now has immediate access to buildings that were previously locked with a key after normal business hours. "And not to mention the fact that the Continuum installation has greatly improved our confidence level that our security staff will respond correctly and rapidly to a fire emergency," Kausch adds.



Machine Control Center (MCC)

Custom Applications and Reporting Capabilities

The DOE sometimes requests reports from all the National Labs of the names and citizenship of their visiting scientists. Previous to Continuum, says Kausch, it took two students an entire summer to review a stack of paper sign-in sheets eight feet high "And they never did finish," notes Kausch. "Now with Continuum, we can generate and run this report for DOE in minutes!"

Continuum has also helped to automate the withdrawal process for spare parts from JLab's technician stockroom. The JLab experimental schedule runs 24/7, and now at any time day or night, any of the 300 technicians with a stockroom account can withdraw needed repair parts. The technicians simply present their cards to the reader outside the stockroom door and then again inside to a reader on the stock room inventory



Continuous electron beam is injected into the accelerator tunnel

control computer system. The Continuum access control system and dual technology video ID badges eliminate the expense of a 24-hour stockroom attendant and the delays associated with contacting a security guard to unlock the stockroom.

Phase II Plans

Kausch says Phase II plans for JLab's CANS will include the installation of additional card readers to control access to smaller areas within existing controlled areas, computer rooms, clean rooms and chemical rooms, and the machine shops. JLab is also taking a hard look at integrating digital video recording using TAC's digital CCTV system, DigitalSentry.



Cryomodules connected end-to-end around the accelerator tunnel