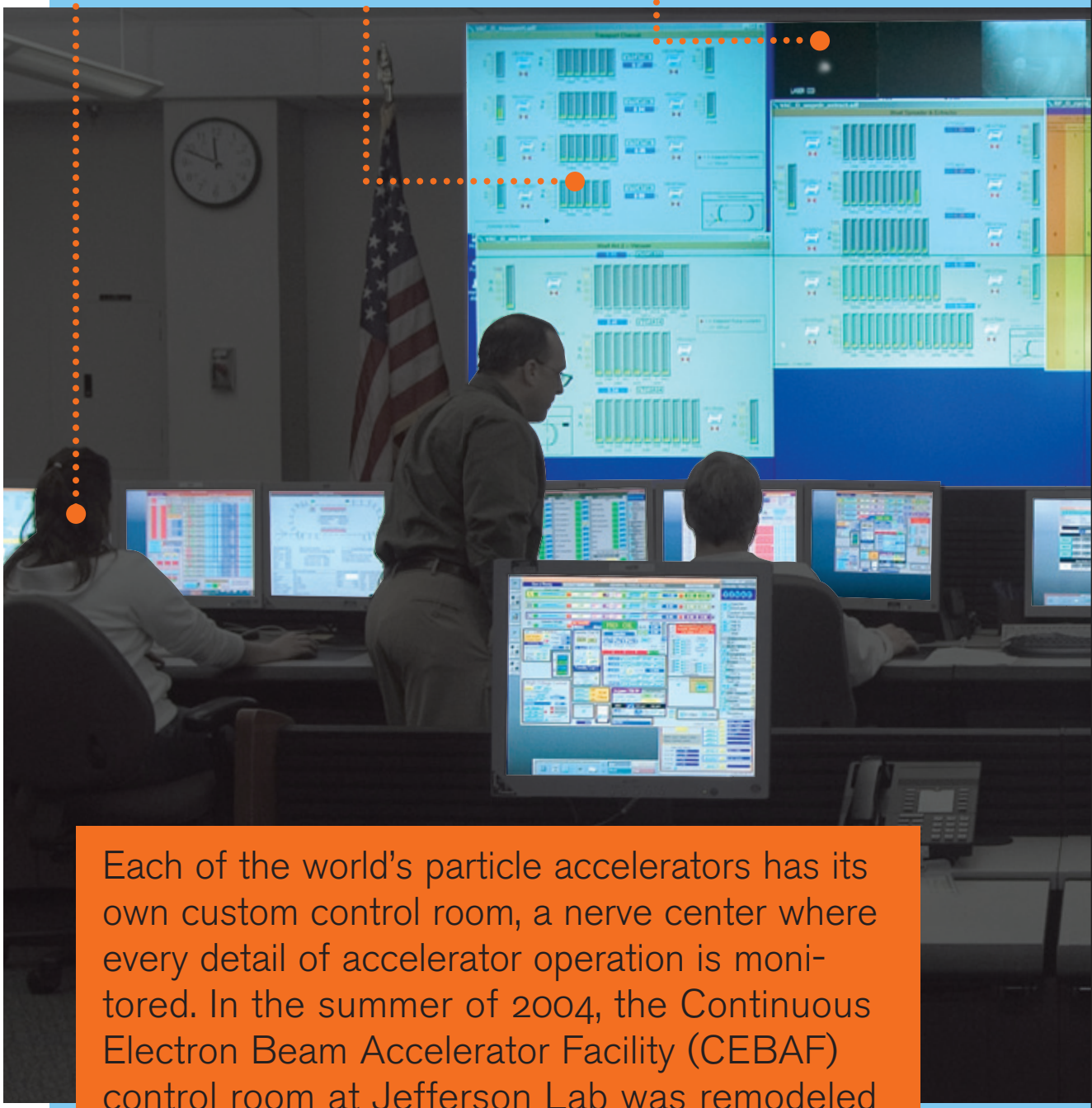
deconstruction: control room

Cold electrons at warp factor one
CEBAF accelerates packets of electrons to nearly the speed of light and slams them into an experimental target. Accelerator operators oversee this process with thousands of monitoring devices located throughout the accelerator, all of which feed into the control room and can be pulled up on any of the individual computer monitors or the display wall.

A new view of the accelerator
A seamless screen of rear-projection cubes bearing DLP™ (digital light processing) technology replaces the traditional roomful of monitor-bearing computer racks. The screen displays machine status information, training videos, web pages and even important satellite channels, such as the weather station.

Electron beam view
As the path of an electron is changed, it emits photons of light, which are captured with a special kind of camera called a CCD (charge-coupled device). This monitor provides a non-invasive, real-time determination of the beam's overall performance, including its energy and stability.



Each of the world's particle accelerators has its own custom control room, a nerve center where every detail of accelerator operation is monitored. In the summer of 2004, the Continuous Electron Beam Accelerator Facility (CEBAF) control room at Jefferson Lab was remodeled for the first time since it was built in 1990.

From so-so grades to high marks

The original accelerator control room raised several red flags in Jefferson Lab Occupational Health and Safety workplace assessments. The redesigned room includes indirect, full-spectrum lighting to simulate daylight, a new air-handling system and improved floor. CEBAF's control room now receives high marks in ergonomics and functionality assessments.

A detailed view of operations

Operators can focus on any of the accelerator's 43 cryomodules, each essentially a sophisticated thermos bottle to facilitate superconducting accelerator operation. These screens show a cyromodule located in the northern linear accelerator, one of two linear accelerators connected by arcs of steering magnets in CEBAF's racetrack design.

The people in control

Four stations directly in front of the DLP cubes seat accelerator operations staff, and two consoles in the center of the room are reserved for accelerator operations principal investigators, who provide additional expertise when solving problems.

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Photo: Greg Adams, JLab

Keeping an Eye on Operations

The Crew Chief oversees the entire room's operations while the Program Deputy, responsible for the accelerator program, has an alternative view of the action. The Safety System Operator is focused on camera shots of accelerator access points, but the Personnel Safety System (PSS) status is visible to anyone in the room. Accelerator operators credit the new control room design with helping them run CEBAF more efficiently.