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ON TARGET

THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY • A DEPARTMENT OF ENERGY FACILITY

MCC undergoes a makeover

Jefferson Lab's accelerator control room gets a new face

by Kandice Carter

Nowadays, a person unhappy with his or her appearance can get an "extreme makeover" and completely redraw their features and figure with a few slices of the surgeon's scalpel. Thanks to reality shows, a studio audience can follow the patient's months-long transformation from ugly duckling to swan in the space of an hour, with the new and improved subject revealed to gasps of surprise from the audience and tearful family members at the close of the show.

Over the summer, the CEBAF accelerator control room, located in the Machine Control Center (MCC), underwent a similar transformation. But no high-priced physicians were called in, and the result was no surprise to those who knew the control room best. Laboratory staff members and external contractors rolled up their sleeves and jumped into the fray from the outset, carefully sculpting the accelerator's nerve center into a state-of-the-art, technologically advanced and ergonomically sound control room for CEBAF.

Initial construction began on the control room in 1990. In those days, computer operators saved data to large floppy disks, cellular phones were the size and weight of house bricks, and the Internet was known only to the scientists who had invented it. While the rest of the world traded in floppies for compact discs, picked up pocket-sized cell phones and learned to surf the World Wide Web, the control room

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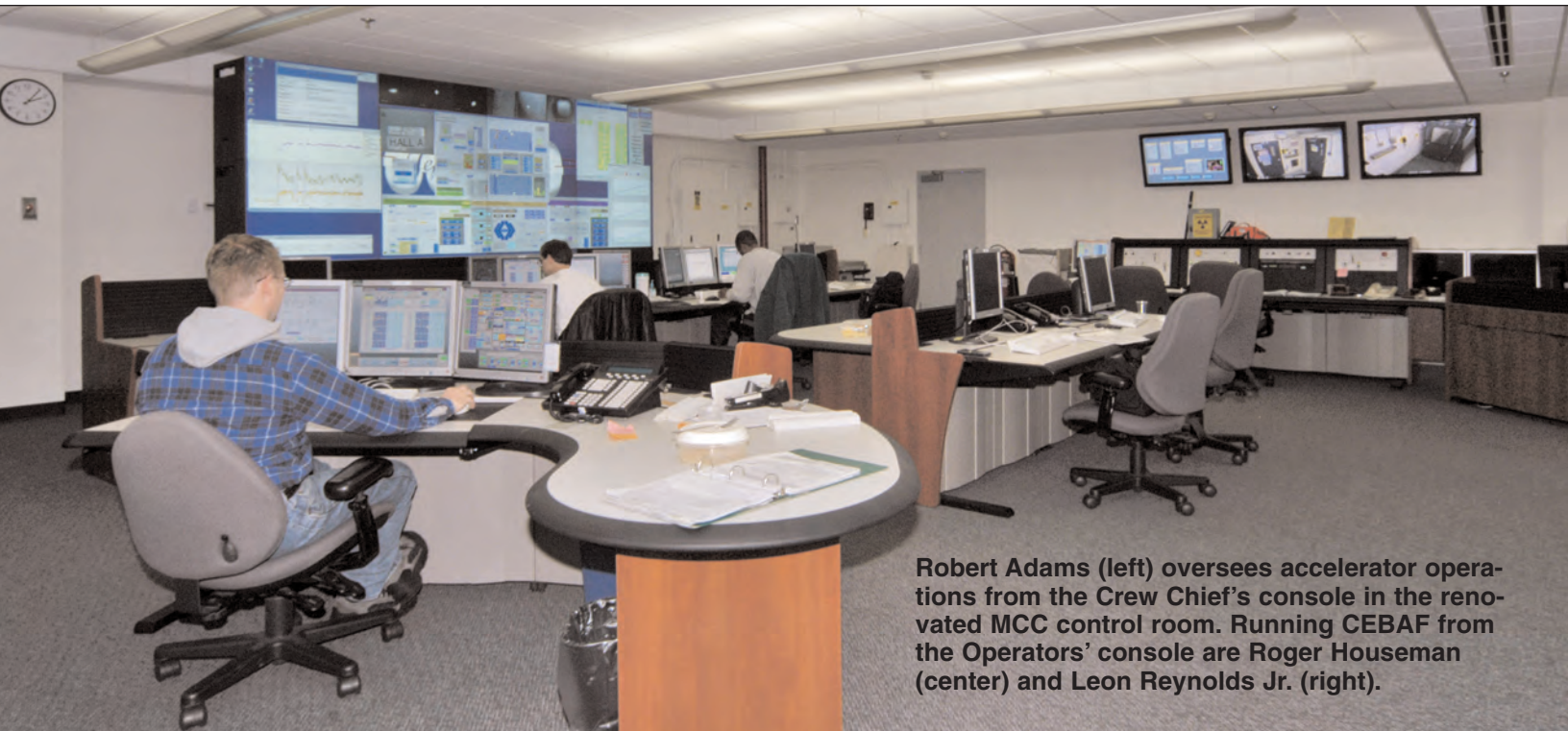

Robert Adams (left) oversees accelerator operations from the Crew Chief's console in the renovated MCC control room. Running CEBAF from the Operators' console are Roger Houseman (center) and Leon Reynolds Jr. (right).

MCC gets a makeover...

Debbie Bruhwel was one of a team of volunteers who re-terminated — put new connector ends on — the hundreds of cables in the control room.

Continued from page 1

largely remained a child of the year it was built.

Operations Projects Group Leader Mike Spata and Information Systems Administrator Tom Oren spearheaded the makeover effort. Spata explains that some updates were made as the need arose, "As time went on, we began to digitize and miniaturize. So we began using flat panel monitors, and more and more of our analog equipment was made digital in the field." For instance, hefty CRT monitors were replaced with trim LCDs, older computers gave way to faster, cheaper models and additional equipment was added on a piece-by-piece basis. But the same, basic foundation on which the control room was built remained in use.

The Winds of Change Were Blowing

The accelerator control room failed workplace assessments performed by JLab Occupational Health and Safety Medical Director Dr. Smitty Chandler and JLab Assessment Engineer Hugh Williams. They found that the control room didn't measure up to the standards published in the International Standards Organization (ISO) Ergonomic Design of Control Centers report and that it also failed to meet some Lab EH&S (Environmental, Health & Safety) standards. The assessments noted many issues that needed to be addressed, including an elevated background noise level that could potentially interfere with operators' ability to hear alarms, computer screens with excessive glare and a less-than-ideal floor layout that contributed to what assessors referred to as a generally stressful environment. However, three areas were of particular concern.

The first area involved ergonomics. The assessments noted that the outdated system of equipment racks accelerator staff used to mount various monitors was not optimal. "We had three tiers of displays mounted in racks to display all the systems we need to monitor. And the upper tier was too high for the operators, so the angle they needed to tilt their heads to see these monitors was too severe," Spata notes. Dr. Chandler also found that the one-size-fits-all, non-adjustable desks compounded the problem.

The air-handling system represented another opportunity for improvement. The system served a dual purpose: it cooled equipment as well as people. Air was piped into the control room via the open space between the floor system and the concrete foundation of the MCC. From there, it was forced up directly into the rack system and through other floor vents into the room. This setup provided a potential breeding ground for mold, mildew and other problems. Plus, a single air-handling system fan produced noise equivalent to two-thirds the level for which

Continued page 10

The MCC control room was completely gutted in 1.5 days, including removal of all the old telephone lines. Then began the process of putting in new phone lines and running, bundling and staging cabling for the new systems and equipment.

From the Director

Christoph Leemann
Jefferson Lab Director

We must commit to doing our work in the safest way possible

Dear Colleagues:

The only good work place is a safe work place. Calling a work place "safe," includes commitment by all staff and all levels of management to achieve the goal of "zero" injuries — that is, none at all. Committing to that goal means having put in place — or doing so aggressively — the engineering safeguards, work management practices and procedures, and other measures that will bring us closer to the goal of "zero." It means having a true safety culture, the set of universally understood rules and values that will make it unthinkable for anyone to take a safety short cut or to stand by and watch one being taken. This effort amounts to a journey. We're not there yet, and as we get closer it will become more of a challenge to achieve higher levels of safety. The important thing is to continue to strive for improvement. Safety means valuing each other: this mindset reflects a true commitment and is a condition of continued employment for all JLab employees.

Throughout the working world, commitment to and performance of safety is measured primarily by two numbers: total recordable case rate (TRC) and days away, restricted, or transferred (DART). Viewed in isolation, these numbers seem to have little relationship to the grave events we all want to avoid, but in fact they are very relevant. Looking at whole industries, we see that the occurrence of severe accidents goes together with elevated TRC and DART figures, which in turn are presaged by high numbers of lesser occurrences and near misses.

Sustained low TRC and DART values are an indicator of an organization that has made a commitment to the safeguards and behaviors that make for a safe workplace. Conversely, elevated figures are an indicator that all is not well and that the overall situation amounts to "an accident waiting to happen."

Jefferson Lab's safety performance for fiscal year 2004 was among the poorest of the 10 Office of Science laboratories: could something terrible happen here? Sustained, significant improvement is needed in order to better ensure the health and safety of our employees, users and visitors, and the public's investment in this Laboratory.

I will update you briefly on what Lab management is doing. Several months ago, I chartered three ad hoc committees to examine electrical safety, materials handling and personal protective equipment use at JLab and to identify ways to enhance safety in these areas. The committees have delivered their reports, and on their basis management is developing a prioritized action plan for improving safety performance in these areas. We have strengthened investigation and reporting procedures and now require EH&S performance to be assessed in all employee performance appraisals. Mandatory subcontractor safety training has also been implemented.

In September, I realized that it may be necessary to get the fresh look that an "outsider" can best provide. We hired a team of outside experts — a consulting firm called PrSM — for a detailed Work Management Review. A six-person team visited the Lab for a week and provided us with an assessment and an improvement plan. We are now in the process of integrating our earlier safety improvement activities with the subcontractor's recommendations to create a comprehensive JLab Safety Improvement Plan.

I will devote another column to the action plan. Here, I will simply highlight a few changes that have been implemented. We created a new position: Laboratory Safety Director. The position calls for an experienced manager to drive change, to make work planning rigorous and robust, and to focus and direct EH&S process direction. This position reports directly to me and will guarantee that all EH&S issues needing my attention will promptly get it. The job is posted and we've begun aggressively recruiting. Until the position has been permanently filled, a PrSM employee, Butch Meier, is performing the job in an interim capacity. Butch joined the Lab and the Director's Council on Nov. 17. In addition, we've formed a Director's

Continued on page 16

Say Hi! to HYCAL

Hall B experiment takes high-precision measurements of chargeless pion

by Kandice Carter

Hall B staff recently installed Jefferson Lab's newest detector: a hybrid calorimeter nicknamed HYCAL. It was designed and built in just over three years by the PrimEx Collaboration. The detector system weighs in at about six tons and required nearly a million dollars to construct. According to PrimEx spokesperson Ashot Gasparian, an associate professor at North Carolina A&T State University, the calorimeter is designed to make high precision measurements of the lifetime of the chargeless pion, or pi-0, particle. Physicists hope this information will tell them more about symmetry in nature.

The Chargeless Pion

Pions are the lightest particles made-up of quarks, and they are commonly produced in experiments with CEBAF. There are three types of pions, referred to by their electric charge: a positively charged, a negatively charged, and a neutrally charged, or chargeless, pion. Positive and negative pions each contain two quarks. But the chargeless pion is different in that it can't be described quite so easily; physicists can't pin down its constituents at any one moment in time. The chargeless pion is best described by a mathematical formula physicists have derived for it from statistical probabilities. According to this formula, it contains some combination of four different quarks.

"The pion is the lightest hadron [subatomic particle composed of quarks] in nature, and its properties are the easiest to calculate from theory," Gasparian explains. Early particle theory suggested that the lifetime of a pion should be around 0.0000000000001 second, or one femtosecond. But experimental observations of pi-0 showed that the lifetime is actually much smaller, 0.0000000000000001 second, or one attosecond. This may not look like a huge difference, but it's the equivalent of expecting a turtle to live about 1,000 years and finding that it only lives a single year. Theorists found that calculations incorporating symmetry violation resulted in a figure that was much closer to the actual pion lifetime. It's thought that a more precise experimental measurement will provide information on the pion and on symmetry violation.

A Hybrid Calorimeter

The chargeless pion leads such a short life that it's difficult to measure directly. However, practically all pions decay into two photons, and in certain circumstances, a pion can also be created with two photons. The

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The PrimEx collaboration (at right) met inside of Hall B for a group photo in August while installing HYCAL. The top image shows the hundreds of feet of cabling needed to carry data signals from HYCAL to the Hall B computer server.

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process is called the Primakoff Effect, in honor of Henry Primakoff, who, in 1951, postulated that physicists could measure the lifetime of chargeless pions indirectly by way of this two-photon creation and decay process.

According to Dan Dale, PrimEx spokesperson and associate professor at the University of Kentucky, PrimEx scientists will produce a pion by bombarding a nucleus with photons. The nucleus will interact with a photon by spitting out one of its own. "The nucleus always has a cloud of photons around it. We call this cloud the Coulomb field," Dale explains. When the two photons collide, a chargeless pion is formed. The pion cruises along for about one attosecond before it decays back into two photons. The lifetime of a pion created by this simple process will be measured indirectly by measuring the energy and position of the two photons.

"This experiment detects the two photons. And for that, we needed a big calorimeter with high resolution," Dale adds, "The best option available for measuring these photons was newly developed detectors containing fast scintillator crystals made from lead and tungsten." But at $600 for a detection area of two by two centimeters, the scintillator crystal detector assemblies were expensive.

"Our initial R&D showed that if we were to make a big calorimeter with all crystal detectors, it would be very costly. So we needed a compromise of cost and performance," Gasparian says. To balance the high cost of the scintillator crystal detectors with the need for a large detection area, the scientists decided to make a hybrid calorimeter. Part of the package would use the crystals, but the other part would make use of a less expensive detector: lead glass Cerenkov counters costing $500 per four by four centimeters of detection area.

How It Works

HYCAL's final design called for a matrix of detectors: the inner section employs 480 lead tungstate scintillator crystal assemblies, and the outer section contains 663 lead glass Cerenkov counters. "The high resolution part of HYCAL is twice the size it was originally designed to be, and we hope that will make the experiment more successful," Gasparian says.

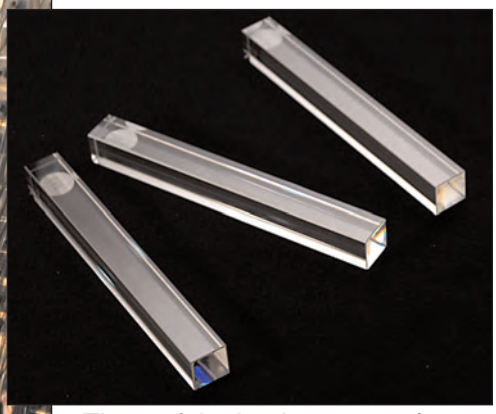
"The most energetic photons should enter the detector closest to the beamline. These particles will enter the scintillator crystal detectors, which are capable of providing the best quality information," Dale adds. Once a photon enters a scintillator crystal, it's converted into a shower of particles that emit photons of visible light. These light photons are trapped in the crystal by a layer of reflecting material wrapped around each crystal and sealed with an ultrathin layer of Kevlar®. The light photons travel through the 18-centimeter long crystals into photomultiplier tubes. These photomultiplier tubes detect, amplify and transform the light photons into electrical pulses, which are then digitized and sent to the data acquisition system designed by the PrimEx collaboration.

Photons entering the 45-centimeter long lead glass cylinders of the Cerenkov detectors go through a similar process, though the principles of detecting particles with lead glass are slightly different than those for lead tungstate. Photons entering the Cerenkov detector modules generate showers of particles as they do in lead tungstate. The speed of light within

Continued on page 6

Ashot Gasparian (foreground), one of the PrimEx spokespersons, takes a moment while in Hall B to reflect on the work that brought HYCAL to this point. The detector package and fellow collaborators are visible in the background. PrimEx stands for the Primakoff Experiment and gets its name from the Primakoff Effect. It's also a PRIMe EXperiment for Jefferson Lab!

Jarreas Underwood, Physics Division, uses an ultraviolet lamp to install the multichannel light monitoring system for HYCAL. A Major Research Instrumentation (MRI) grant from the National Science Foundation provided most of the funds for HYCAL. The PrimEx collaboration includes more than 70 members from 18 U.S. universities and five institutions from outside the United States. In the last three years, more than 40 undergraduate and graduate students participated in preparing HYCAL for its first experimental run.



Three of the lead-tungstate fast-scintillator crystals.

One of the complete lead-tungstate modules used in the high-resolution scintilator portion of HYCAL.

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the lead glass is slower than that in a vacuum, and many of these shower particles are able to travel faster than light can travel in the lead glass. As a result, a flash of light is emitted, somewhat analogous to the shock wave of a supersonic boom emitted by a plane traveling faster than the speed of sound. This so-called Cerenkov light is detected in the photomultiplier tube at the end of the glass.

"From these measurements, we are gauging the energy and position of each particle that enters the system. We can reconstruct the event, which gives us so-called invariant pion mass — how heavy was that particle. And that way, we are actually detecting pi-0s through the photons they emit," Gasparian explains.

Taking Data

HYCAL began taking experimental data September 27. It will take data on pions that emerge from three different targets: carbon, lead and tin. Measuring the differences in the pion lifetime that each target gives will serve as a kind of quality control check for the experiment. Scientists hope to get enough high-quality information to fine-tune the lifetime of the chargeless pion and to test the theoretical predictions of this lifetime.

"The next experiment will measure the lifetime of the next particle up, the eta meson. For experimental physicists this is very interesting and exciting work," says Gasparian. In addition, Dale is looking forward to further experiments on the chargeless pion, which may yield a more detailed picture of the particle's structure.

DOE Site Office aligns with Office of Science restructuring

Four new staff members added over summer

"The addition of four new employees over the summer to the Department of Energy's JLab Site Office completes its staff hiring and aligns it with the recent Office of Science restructuring project," notes Site Office Manager Jim Turi.
The Office of Science (SC) restructuring — dubbed OneSC — eliminates a layer of management, provides site managers with authority to administer their laboratory's contract, redefines roles and responsibilities for headquarters and field managers, and clarifies lines of authority and accountability.

The reorganization rolled out in late March 2004 with a statement from Director Ray Orbach, saying: "…the need for OneSC began with my conclusion that the current structure did not provide me, as Director, sufficiently direct lines of communication and accountability within SC. …An example that particularly concerned me was the lack of a direct relationship between the Program Associate Directors and the Site Office Managers upon which I could rely for a "sense of the laboratories." …After careful consideration by me and the senior management team, we developed the OneSC structure. A first step towards demonstrating that, as stewards of over $3 billion of the taxpayer's money, our management is indeed 'best in class.'"

New members of the DOE Site Office staff at JLab include:

Joseph May, accelerator operations and projects director, is following the Lab's accelerator program. His most recent position was facilities disposition team leader at the West Valley Demonstration Project, a DOE nuclear clean-up project located south of Buffalo, N.Y. May brings over 18 years of project management and nuclear operations experience with him.

Dennis Brittin, business specialist, performs fiduciary business and financial management duties for the office. Brittin comes from the Naval Operational Logistics Support Center in Norfolk, where he served as the director of the administrative services department. Prior to holding that position, he was the deputy comptroller for the Fleet and Industrial Supply Center in Norfolk.

Steve Neilson, industrial/occupational safety specialist, shares responsibilities to track JLab's Environmental Health & Safety programs with Barbara Morgan. Neilson comes to the DOE from the Army Corps of Engineers, where he served as the S&H manager at the NASA Plum Brook Reactor Decommissioning Project in Sandusky Ohio. Prior to that assignment, Neilson spent several years with the Navy as a civilian industrial hygienist and has contract work experience with the National Institute for Occupational Safety and Health (NIOSH).

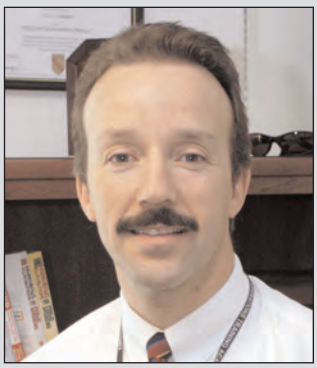
And, Scott Mallette joined the Site Office staff as deputy site manager as reported in the Sept./Oct. 2004 On Target newsletter.

For additional information on the OneSC restructuring, visit the DOE Office of Science web site at http://www.science.doe.gov/.

Joseph May

Dennis Brittin

Steve Neilson



Scott Mallette

Jefferson Lab Information System Toolkit (JLIST)

New data management system replaces antiquated CIS

by Judi Tull

After months of diligent work, the Management Information System (MIS) staff launched the Lab's new people-information system late this summer. JLIST, which stands for Jefferson Lab Information System Toolkit, replaced the outdated Central Information System (CIS). It streamlines processes, is more accurate and easier to read on a computer screen than its predecessor.

"CIS was antiquated," says Kari Heffner, MIS manager, shortly before the launch for JLIST. "It was based on obsolete technology and software. It's time for us to move into the 21st century."

The five-person JLIST team from the MIS office first had to learn JAVA/J2EE, a new technology that provides the basis for JLIST. Heffner describes the platform as "very solid," and says it is touted as being highly adaptable so it should stand the test of time.

Those monochrome text-only pages of CIS are a thing of the past, and there's no more keystroking to move within the system. JLIST has done away with the old command-line text-based operations and moved all the functions into a web-based site on the Lab's Intranet.

"This system is very self-explanatory," Heffner says. "Anyone who has used the Internet will be able to use this." All of the computer systems that provide information across the Lab are moving to integrated web-based technologies. For example, the new Facilities Management Space Information System (see accompanying story) — can now talk directly to JLIST so that information across these platforms is continually and consistently updated.

"We're creating a totally integrated work flow environment," Heffner says. JLIST is accessible from the MIS page as well as from the Insider (Intranet). (On the Insider page, JLIST is under the Popular Resources heading in the column on the right.)

Unlike CIS, where customers keystroked their inputs and many individuals could change information in it, JLIST limits inputs almost entirely to drop-down menu selections and the number of people who have permission to change information has been limited.

"We've locked down the data input with fewer free text fields and the number of information input managers," Heffner explains. "We have data validation where we didn't have it before."

Heffner notes that the system is easier to maintain when changes are needed and anticipates that the built-in constraints will prevent errors. "We think people will find it a major improvement over CIS," she said.

The Management Information System staff, in the office of the Chief Information Officer, gathered for a group photo. Pictured front, left to right, are MIS Manager Kari Heffner, Margaret Ridley, Dana Cochran and Robert Lawrence; middle row, l. to r., Denise Vitale, Geoffrey Barth, David Buckle and Mike Staron; and back, l. to r., VenKata Jagannath and CIO Roy Whitney. Not pictured: Cynthia Hall and Eric Cooper.

Facilities Management develops JLab Space Information System

Will streamline work, interact with JLIST

by Judi Tull

For the first time in its history, Jefferson Lab has a custom-made Space Information System (SIS) that accurately shows every room in every building, its dimensions, function and even who's in it.

For years, the details of the Lab's buildings were stored haphazardly. "Some were on paper, some were stored in CAD (computer-aided design programs) and some were non-existent," said Ed Winslow, the Facilities Management staff engineer who set out to solve the problem two years ago.

When Facilities Management Director Rusty Sprouse took over in 2000, he realized that the lack of a cohesive record of the Lab's spaces was a major shortcoming. He brought in several software vendors to demonstrate their products, and Winslow sat in on the meetings. The software offered a lot of "bells and whistles" that the Lab didn't need, but the demonstration got Winslow thinking about the applications. "What they did was pretty cool," Winslow recalled, "and it piqued my interest. It looked like something I could do."

Since tinkering with computer code is one of his favorite pastimes, Winslow set out to design a program that would communicate with AutoCAD to record and update building space information specifically for the Lab. Working with code is like puttering in a "woodshop" for Winslow. "It's something I do in the evenings when I can't be outside surfing or fishing," he said.

While Winslow did the programming work, Facilities Management draftsman David Fazenbaker did the footwork. With a tablet PC in hand, over a period of about six months, he went through every building and into more than 2,000 rooms to record dimensions and other information, such as construction materials, locations of windows, and even whether or not there's carpeting on the floor. "David really wore out some shoe leather on this one," Winslow commented.

The biggest benefits accrue to the Facilities Management department and its ability to streamline its work. In the past, for instance, when an office needed to be painted, someone had to physically go to the room, take a tape measure and figure out how much paint would be needed. Now, one quick mouse click brings up a box with 13 categories of information along with a box for specific comments.

Since AutoCAD has a web interface, SIS can be accessed using any Lab computer loaded with Internet Explorer, making it a revolutionary tool that can also bring up reports, based on whatever parameters the user selects. It can, for instance, detail how much occupiable space the Lab has, making required reports to the Department of Energy much easier for various offices within Facilities Management. SIS provides accurate and quick calculation of the gross and occupiable square footage of each building for annual data entry into DOE's Facilities Information Management System (FIMS). In addition to this DOE requirement, SIS provides Facilities Management with a valuable tool to effectively manage over 750,000 square feet of space, according to Rebecca Yasky, JLab's 12 GeV Upgrade Civil associate project manager and former Facilities Maintenance and Construction manager.

Winslow has worked with the Lab's Management Information System (MIS) staff to integrate SIS into the new JLIST system. Since the success of SIS is integrally tied to the accuracy of the information in the Lab's main database, it has been designed to overcome the shortcom-

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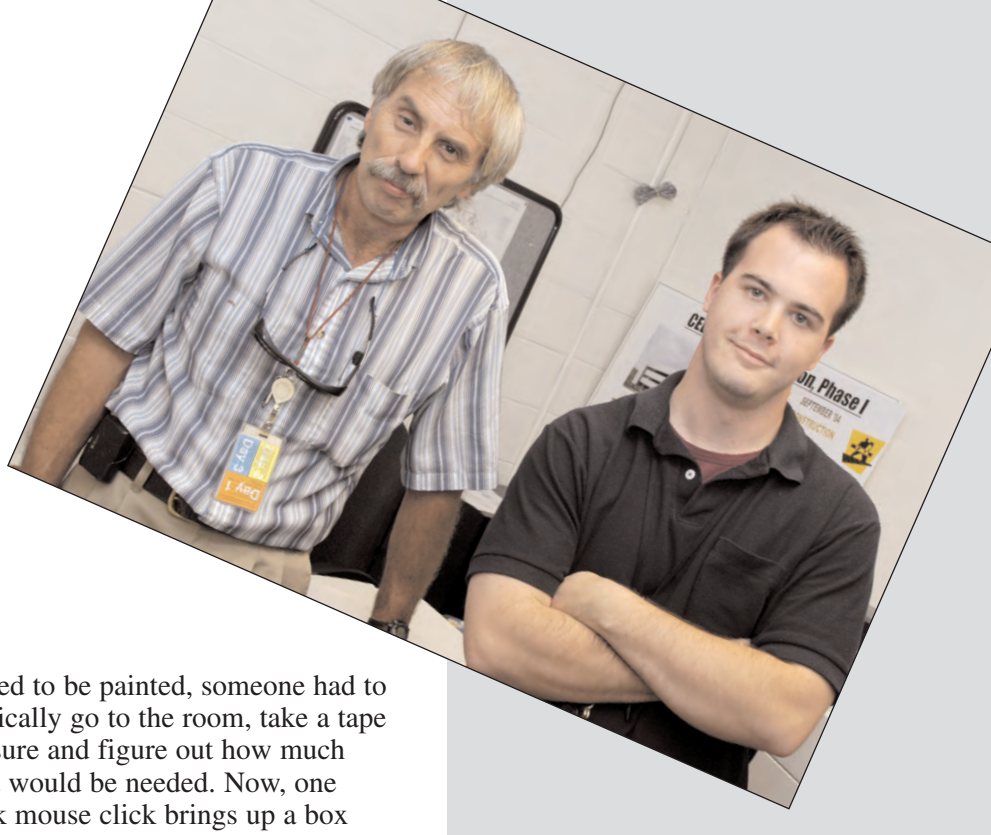

Facilities Management's Ed Winslow (left) and David Fazenbaker break for a moment during their work.

MCC gets a makeover...

John Jefferson (left to right), Percy Harrell, and student intern, Mike Correa, examine the new cabling as they prepare to re-install the Personnel Safety System.

Continued from page 2

OSHA requires ear plugs. The assessments called for replacing the entire system with one that was both quieter and separate from the floor system.

Finally, the aging floor structure offered another strong impetus for change. "Fundamentally, the flooring had failed," Spata explains, "The floor tiles were galvanized steel with cement cores, and the carpet, which was well over 10 years old and truly disgusting, was integral to these tiles. So effectively, the entire floor system needed to be replaced."

Galvanized floor tiles are also theorized to be the root cause for computer server failures over the years. Firms using the tiles had discovered that the zinc used in the galvanized steel could separate from the steel, growing into so-called zinc whiskers. These microscopic hairs could flake off, get dispersed by the air handling systems into computers and potentially short out circuit traces within the servers. Plans were made to replace the entire floor system during the scheduled accelerator down period in the summer of 2003.

Making the Case for a Makeover

Those plans changed when Spata and other operations staff attended the Workshop on Accelerator Operation in Japan during March 2003. There, operators attended sessions and heard talks about how other accelerators were run. They saw pictures of other control rooms and learned about design options that hadn't been available when CEBAF was first built. And they listened to what other operators, from around the world, wanted to see in a control room. For Spata, the trip sparked a new idea: instead of just replacing the carpet, perhaps they should consider more extensive renovations.

Spata assembled a team to explore remodeling options, and within months of the workshop, the team had put together an initial proposal for completely restructuring the control room. They presented their ideas during the August 2003 budget meeting. According to Associate Director of the Accelerator Division, Swapan Chattopadhyay, "They worked very hard to conceptualize it, and they were willing to be flexible in terms of cost and design." After an initial signal of interest, team members began fleshing out their ideas, exploring vendor options and calling in Jefferson Lab employees from other departments to help create a more user-friendly control room.

The core design team and other employees struggled through 10 months of choosing, reviewing and re-reviewing options. Employees not involved in the design process were called in to independently review the plans. By the time project approval was granted, the original proposal had undergone a full 13 revisions.

Finally, during the scheduled accelerator down in August 2004, accelerator control was transferred to a temporary control room set up in the conference room of Building 87, and the entire accelerator control room was gutted down to the concrete foundation. Employees from across the Lab and contractors pitched in to help renovate the room in the 21 days allotted. In the end, more than 50 people, representing nearly every division at the Lab, were involved with some aspect of renovation planning, review and implementation. This collaborative effort has resulted in one of the world's most advanced accelerator control rooms.

The Control Room's New Face

When you step through the main entrance of the Machine Control Center, the first thing you notice is the control room itself. A framed-glass wall allows you to immediately see what's going on in the Continuous Electron Beam Accelerator Facility's nerve center. What's more, the original anteroom referred to as the fishbowl has been removed, so now the control room is one entirely open room. While these cosmetic differences make a dramatic impact, the truly useful changes can't be seen until you enter the room itself.

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Before the renovation, a large conference-style table squatted in the center of the room, with a smattering of chairs at its perimeter and a permanent collection of logbooks piled at its center. To the right, another table housed camera monitors and safety systems. And sprawled out in a large, square horseshoe shape along the back wall, tall, blue racks of equipment and monitors towered over controllers sitting at keyboards placed on a utilitarian counter that ran the length of the racks. All vestiges of that layout are gone.

In its place are six distinct work areas. On the left side of the room, in place of the fish bowl, are four connected workstations reserved for vacuum, magnet and other accelerator specialists who may need a terminal to check CEBAF operations. These four stations are arranged in an open horseshoe pattern. Like all workstations in the room, each one has its own computer, chair and adjustable keyboard. Also on the left side of the room, a semicircular work area with a bank of computer monitors denotes the Crew Chief's domain. This area includes a wall-mounted white board and bulletin board. The Crew Chief's new location and orientation to the space is intended to emphasize that individual's role as shift supervisor with an unobstructed view of the entire facility.

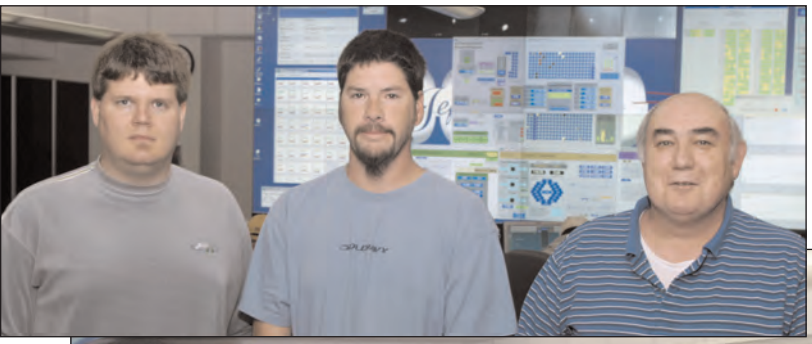
The safety system operator and related equipment is situated on the right side of the room, with a clear view of three flat-screen monitors mounted on the right wall that depict camera shots of accelerator access points and an overview of the Personnel Safety System status viewable from anywhere in the room. The program deputy workstation is con-

Continued on page 12

MCC Ops Group invites campus to Control Room Open House

The Machine Control Center Operations Group invites all JLab users and employees to visit the recently renovated CEBAF Control Room, located in the MCC (building 85). The MCC group is hosting an Open House on Wednesday, Dec. 22 from 2-4 p.m. for everyone on campus to stop by and see the major improvements made to the control room and to chat with CEBAF operations staff.

Individuals that don't have GERT or RadWorker training may contact Debbie Magaldi, public affairs (ext. 5102, magaldi@jlab.org), to arrange for escort and transport to the control room. "This is the heart of CEBAF," says Operations Projects Group Leader Mike Spata. We are proud to have a world-class facility, and we'd like to share what we've done with everyone at the Lab. We hope you will stop by on Dec. 22 so we may share with you the results of this project."



Several dozen employees from across the Lab and five different contractors worked under a very tight schedule to get the renovation work completed on time. Many of them met after the job was finished, for a group photo in the renovated control room.

MCC gets a makeover...

Continued from page 11

nected to the safety system operator's station and located adjacent to a collaborative problem-solving area in the corner of the room. Situated about 15 feet from the back wall is a workstation for accelerator operations staff, outfitted with four stations along its 11 foot length. Finally, two consoles in the center of the room are reserved for accelerator operations principal investigators who aid in program execution and provide additional expertise when solving problems.

A seamless screen of rear-projection dlp (digital light processing) cubes along the back wall has replaced the monitor-bearing blue computer racks. The screen displays all the information that the multitude of monitors in the racks formerly displayed and then some. The system is run by an independent processor, whose sole function is to arrange the information operators need in a logical format. "Previously, our view of the machine was housed in a series of 14 different displays, all showing different pieces of the control system," Spata notes.

Now, operators look to the video screen for all that information, which can be viewed comfortably from any point in the room. "Display of information is just as important as control of information. Because most of the time, your ability to solve a problem depends on your ability to know what the problem is," Chattopadhyay says.

Of the 20 or so blue racks, only three remain. Painted the color of putty, they're lined up unobtrusively along the back of the left wall and house the remaining essential analog equipment as well as some additional hardware to handle analog and video signals from the field. In addition, a new air-handling system sends currents of comfortable air through vents in a ceiling that has been raised about a foot. New lighting fixtures produce full-spectrum light, providing more natural-looking white light than fluorescent lighting. One door was removed, and most printers were relocated to the MCC copy area. The floor structure was realigned and the old cement tile system replaced with a new, carpeted system that is easily maintained. A coffee station along the right wall rounds out the room's accoutrements.

In the end, the control room renovation addressed nearly every point identified in the ergonomics assess-

Continued on next page

Before
Pictured above and right: A cluttered layout and aging lighting, flooring, equipment and electronics posed a variety of ergonomic and efficiency problems for the MCC Operations group.

Continued from previous page

ments; and all of the work was completed within the normal accelerator down time, without causing a single lost hour of operation. It's anticipated that these fundamental changes, and others, will help accelerator operators run CEBAF more efficiently. "The problem solvers, the people who run the machine, and the people who run experiments can all have this integrated approach to problem solving and gathering information. It must mean that the machine will be up and running for more time, percentage-wise, than it was before. So the availability of useful beam for physics must go up. The machine itself hasn't gotten better, but your ability to see what is wrong and act on it is better," Chattopadhyay says.

Spata sees CEBAF's new face as the next leap forward in accelerator control room design. "We're the first accelerator control room to throw away the equipment racks wholesale and go to a more digital environment. We're leading here, and that's an exciting thing. And I think people will want to come see what we're doing and copy it," he says.

The Future of CEBAF's Control Room

Now that this phase of the renovation is complete, plans are being made to continue the upgrade effort. Andrew Hutton, deputy associate director of the Accelerator Division, says this renovation lays the groundwork for future improvements in CEBAF control and operation. "We still have problems where the operator is searching through screens looking for the thing that's wrong, and that's slowing down the way we work. A computer can do

Continued on page 14

After

At left: Darrell Spraggins (from left) overseas operations from the newly designed Crew Chief's console as Randy Michaud and Terry Carlino run CEBAF from the Operators' console in the renovated control room. Below: Robert Adams (from left) monitors accelerator operations while Roger Houseman and Leon Reynolds Jr. run the machine. New equipment, flooring and lighting, and a well-planned design have made the control room a safer and more efficient workcenter.

MCC gets a makeover...

Continued from page 13

that search in fractions of a second. The goal would be that the big screen would normally have rather few pieces of information, such as boxes showing that beam delivered to each Hall is OK. If something is wrong, then we would like the system to automatically display information on the piece that is not functioning properly."

Hutton's long-term aim is to make the control system a more robust system that is proactive rather than reactive. "In some cases, there are measurements that we make infrequently because they interrupt beam delivery. So one of the jobs that goes with this is upgrading our diagnostics, which will permit us to achieve real-time observation of every specification at the beam current required by the user," Hutton adds. He says that can be achieved by continually upgrading the machine with new beam diagnostics, by changing the way the control system monitors the machine and by changing the way information is displayed.

According to Spata, the renovation was made with just such future improvements in mind. "There's room for expansion. The layout is intended to support the 6 GeV (billion electron volts) machine, and it's perfectly capable of supporting a 12 GeV machine. I look at it as a long-term investment in the future of Jefferson Lab," he says.

Over the Fourth of July weekend, the new ceiling was raised and the air-handling system was replaced in preparation for the main remodeling effort that took place during the August accelerator maintenance down. Machine operations were never impacted by the renovation.

Milestones
for Sept./Oct. 2004

Hello

David Abbott, Science Education Administrator, Directorate

Jozef Dudek, Post Doctoral Fellow, Chief Scientist Office (CSO)

Karen Chandler, Front Desk Receptionist, Administration Division

Sarin Philip, DC Power Engineer, Accelerator Div.

Jeffrey Saunders, SRF Cavity Production Engineer, Accel. Div.

Ross Young, Post Doctoral Fellow, CSO

Goodbye

Daniel Dale, Hall B Sabbatical Scientist, Physics Div.

Mary Gibson, Occupational Health Nurse, Admin. Div.

William Chronis, Senior Mechanical Engineer, Accel. Div. retired Oct. 1, 2004

Maud Baylac, Injector Scientist, Accel. Div.

Suzanne Roseberry, User Liaison Administrative Support, Phy. Div.

Secretary Abraham announces his resignation from top DOE post

In a letter to President George W. Bush dated Nov. 14, 2004, Energy Secretary Spencer Abraham resigned his position pending confirmation of a new Energy Secretary.

In an open letter sent throughout the Department of Energy, Secretary Abraham wrote:

Dear Colleagues:

As you may know, I today announced my resignation as Secretary of Energy. This was not an easy decision, but one that I concluded was best for my family.

The last four years have been an exhilarating and rewarding time for me. I am enormously proud of the missions and employees of the Department of Energy. ...And, all of us, I think, can look back on the last four years and be proud...

Nonetheless, Jane and I have concluded that the time has come for us to make a change. One of the challenges of public life is properly balancing the demands of one's job with the family and personal commitments one faces. As you know, we have three elementary school-age children and these past four years have posed significant challenges on our family in many ways. Looking ahead, Jane and I have concluded that these challenges will be very difficult to address consistent with the commitment called for in the Energy Secretary's post.

Accordingly, and with the utmost respect, I have decided that it will not be possible for me to continue to serve as Energy Secretary. Therefore, I have submitted my resignation from this post, to the President, to become effective upon the confirmation of my successor.

I am extraordinarily grateful to President Bush for giving me the opportunity to serve in this post. And I am equally grateful to those of you who work in the DOE family who have ensured that this agency's important missions are carried out in the best traditions of professional public service.

Thank you.

Virginia Secretary of Education, Dr. Belle Whelan, visited JLab this fall to learn more about the facility and the range of education programs conducted here. During her visit, Secretary Whelan toured the Lab, saw research being conducted in the Applied Research Center by college students, and (pictured) observed a sixth-grade class performing hands-on activities in a BEAMS classroom. Here she is accompanied by Lab Director Christoph Leemann (right), while Becoming Enthusiastic About Math & Science volunteer Joyce Miller (left) and Steve Gagnon, Science Education technician (far right) assist the students.

From the Director...

Continued from page 3

Safety Council that meets weekly. The council includes me, the Safety Director, the Chief Scientist, and the Associate Directors for the Physics, Accelerator, and Administration Divisions. It will assure top management's involvement in the Lab's Environmental, Health & Safety program as well as the effectiveness of the initiatives we're enacting.

The importance of safety cannot be overemphasized. A place like JLab that considers its employees its biggest asset needs the best achievable safety performance: I cannot accept anyone getting hurt on the job. For the same reason, it is a priority with the Department of Energy's Office of Science. A safe work place can also be a place of quality work, and safety pays: as of today, SLAC's accelerators have not yet resumed operation — a tremendous loss to U.S. science given the intense international competition in this field.

I am committed to making the necessary changes to make Jefferson Lab a safer place to work, and will monitor progress closely. In future columns I will discuss more of the specifics. I challenge each of you to come to work committed to making JLab a safer workplace. The challenge is excellence, not merely compliance. We conduct world-class science at Jefferson Lab and our challenge is to ensure that our work place safety performance reflects this same level of excellence.

With the holiday season upon us, I wish you and your family health, happiness, and safety at home and on travel. I thank you for your commitment to Jefferson Lab and the work you do to support our scientific mission.

Facilities Management develops space information system...

Continued from page 9

ings of the previous Central Information System (CIS). The ability to change or edit information, for instance, is more restrictive than in the past. And users must use a drop-down menu of choices to input information, rather than being able to type an entry freely.

"The biggest problem we've had is bad data in the CIS," Winslow said. "It's the result of years of typos being entered, people moving from place to place, remodeling and so on that was never accurately recorded. CIS would take whatever information anyone put in there, so one person might call something a 'conference room' while another called it a 'meeting room.' That made for a lot of confusion and mis-information. SIS solves many problems for Facilities Management and is forward progress in achieving high quality products."

ON TARGET

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