



National Nuclear Security Administration

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NNSA's Newest Supercomputer Breaks Record

A supercomputer developed through the Advanced Simulation and Computing program for NNSA's Stockpile Stewardship efforts has performed 135.3 trillion floating point operations per second (teraFLOP/s) on the industry standard LINPACK benchmark, making it the fastest supercomputer in the world. By performing computations at these rates, BlueGene/L helps maintain the U.S. nuclear weapons stockpile without nuclear testing.

This performance was achieved at Lawrence Livermore National Laboratory (LLNL) at only the half-system point of the IBM BlueGene/L installation. Last November, just one-quarter of BlueGene/L topped the TOP500 List of the world's top supercomputers.

"Blue Gene/L will address vital challenges critical to ensuring the safety and reliability of the nation's aging nuclear weapon stockpile," said Administrator Brooks. "This supercomputer provides an essential resource to the weapons complex, allowing us to address time-urgent and mission-critical scientific issues that require such specialized computational capabilities."

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HEARING SEASON UNDERWAY: Administrator Linton Brooks testifies at a March hearing before the House Armed Services Subcommittee on Strategic Forces. To his left is Acting Assistant Secretary Paul Golan, who was also on the panel for the hearing. See story page three.

Brooks Discusses Nuclear Terror

The fight against nuclear terrorism must involve all states, NNSA Administrator Linton Brooks told attendees at an International Atomic Energy Agency (IAEA) Conference on Nuclear Security in London last month.

"Opportunities for terrorists and their supporters to access weapons capabilities are expanding beyond national borders, as illustrated by the A.Q. Khan network and its ability to manufacture components off-shore and move weapons-related technology to clandestine end-users," he said.

Brooks said as a matter of principle, unless all states accept sovereign responsibility over activities under their jurisdiction and control - whether that is trade and border controls or regulation of nuclear

materials or nuclear facilities that are in conformance with international regimes, "we risk some future, catastrophic act of nuclear terror. This is a future that we have a collective responsibility to avoid."

He said "the patchwork of treaties, arrangements, and state obligations that form the nonproliferation regime" are facing serious challenges. But he said last February President Bush highlighted nuclear proliferation dangers and called on the international community to "translate into action" the consensus that proliferation

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Supercomputer Breaks Record

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Results of scientific importance have already been accomplished with only one-quarter of BlueGene/L. Scientists at LLNL for the first time have performed 16-million-atom molecular dynamics simulations with the highest accuracy inter-atomic potentials necessary to resolve the key physical effects to successfully model pressure induced rapid resolidification in Tantalum. As a shared resource, BlueGene/L has enabled scientists studying the effects of voids in metal failure at Los Alamos National Laboratory to perform standard accuracy molecular dynamics simulations with more than 2.1 billion atoms.

“BlueGene/L’s latest accomplishment is an important step toward achieving the capabilities we need to succeed in our stockpile stewardship mission,” said Michael Anastasio, director of LLNL. “BlueGene/L allows us to address computationally taxing stockpile science issues at very low cost. Effective and relatively inexpensive supercomputers of this nature will open doors for scientists across the country.”

“This milestone demonstrates our continued commitment to revolutionize the way supercomputers are built and to broaden the kinds of innovative applications we can run on them,” said Nick Donofrio, senior vice president of technology and manufacturing at IBM. “BlueGene/L’s record-setting performance underscores the power of open standards and collaboration in driving true, meaningful innovation that benefits society.”

NNSA Employee Awarded Alumni Honor

Growing up in rural Georgia, Tammie Henderson never envisioned a career involving energy related issues, but that soon changed after she enrolled in Fort Valley State University in Georgia and received a letter during winter break of her freshman year inviting her to participate in the school’s Cooperative Developmental Energy Program (CDEP) program. CDEP is the only program of its kind in the nation where Ft. Valley State, an HBCU (Historically Black Colleges and Universities), is directly

partnered with the energy industry. She was one of CDEP’s original students, and like all participants, she was chosen for the program because of her academic achievements.

Henderson, who currently works as a senior program analyst at NNSA’s Office of Economic Diversity and Impact at NNSA headquarters in Washington, D.C., recently received the prestigious CDEP Gold Alumni Award. The award was started in 1989 and it is given to outstanding alumni who have taken what they have learned from the program and applied their CDEP education and skills to impact the energy industry. It is also a chance for current CDEP students to meet and learn from outstanding former students.

“Tammie’s tenacity and eagerness to excel within the workplace and in her educational pursuits are exemplary,” said Dr. Isaac Crumbly,

founder and director of CDEP wrote in the letter notifying Tammie of her award.

Henderson began her NNSA career with a budget internship at then-NNSA’s Nevada Operations Office in Las Vegas through CDEP and then was offered an accounting position with DOE



CDEP ALUMNI AWARDEE: Tammie Henderson (middle) discusses NNSA Office of Diversity issues with office director Maryann Fresco (right) and Lynn Brownell (left).

upon college graduation. While in Nevada, she completed her Master’s at UNLV and continued working at DOE transitioning to a small business program manager where she handled small business contracts for all of NNSA and received DOE’s “Star Award” and “Small Business Program Manager of the Year” for 2003.

She recently began working at NNSA HQ where she has the task of branding, framing, and creating a vision for NNSA’s HBCU Program.

“CDEP and its partnership with DOE/NNSA was a springboard for my career, I would never have known about a career with NNSA. I hope in my new role at headquarters, I can bring knowledge and experience to other HBCU students,” said Henderson.

Congressional Hearings Require Intense Preparation

When NNSA Administrator Linton Brooks prepares for congressional hearings during the yearly budget season he does so with the advantage of extensive personal experience in government including service as the assistant director of the Arms Control and Disarmament Agency, chief U.S. negotiator for the Strategic Arms Reduction Treaty (where he earned the title of ambassador), director of arms control for the National Security Council, and a number of Navy and Defense Department assignments.

But he also prepares for hearings with assistance from senior managers and teams of NNSA staff members. They help him draft written and oral testimony, research specific issues of interest to committees and individual members of Congress, and put together thick briefing books full of wide-ranging fact sheets on programs, policies, correspondence and controversies.

Anson Franklin, who heads NNSA's Office of Congressional, Intergovernmental and Public Affairs, said preparing for hearings is a massive effort that involves many people – primarily at NNSA headquarters – but also reaches out into field offices and NNSA facilities for assistance.

"This year has been more frenetic than others," he said. "We have a

new Secretary of Energy who had a series of hearings before the major committees we deal with in both houses of Congress. In each case,

James Windle in nonproliferation, Kathy Phelps in security, Floyd Thomas in facilities and Jim Lambert in management and administration

help us with data collection and briefing papers. They, in turn, draw from the expertise of many other people in the programs."

In Franklin's office, he and congressional affairs director Rob Hood review hearing testimony for consistency with previous statements made to Congress and they review testimony and written responses to determine if they are

sensitive to congressional concerns. Franklin and Hood also interact directly with committee staff and members of Congress and their staff on a day-to-day basis throughout the year. They are assisted by Tim Nank, Renee Wilhite and Peter Winokur.

"While there have been some disagreements with Congress on some high profile issues, Congress has by and large been very supportive of NNSA and its programs," Franklin said.

In his most recent "Lintgram" message to NNSA employees, Brooks said, "Thus far, our hearings have gone reasonably well. I've felt very well prepared for these hearings due to a great deal of hard work by people at headquarters."

we supported Secretary Bodman in his preparation with issue papers and responses to questions on NNSA matters. At the same time, Administrator Brooks had his own hearings before five subcommittees in a period of five weeks."

Franklin said Brooks is deeply involved in preparing his own testimony and generally drafts his own oral statements for individual hearings. But the preparation is a group effort that requires every program office to make contributions.

"For example, John Dailey of the Planning, Programming and Evaluation Division pulled together the first draft of the budget testimony this year," Franklin said. "The primary contact people in each office like Tim Evans in defense programs,



HEARING BREAK: Linton Brooks (center) confers with Anson Franklin, director of congressional, intergovernmental and public affairs, (right) and Rob Hood, director of congressional affairs, during a break in a hearing.

Brooks Discusses Nuclear Security At London Conference

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cannot be tolerated and must be stopped.

Brooks grouped the President's proposals into four imperatives:

—Efforts to secure high-risk materials must be expanded. This is an important area of work for the United States and its G-8 and other partners. Cooperation with Russia, given its vast stores of weapons-suitable material, is naturally a first-order priority.

—States must scrupulously comply with international nonproliferation undertakings, whether under the Nuclear Nonproliferation Treaty (NPT), IAEA safeguards, international nuclear and radiological conventions, or the new UN Security Council Resolution 1540.

—The integrity of the NPT and IAEA safeguards must be preserved, especially in regions linked to terrorism, religious extremism, and long histories of armed conflict. Though the articles of the NPT and the original IAEA safeguards agreement were drawn up years ago, they remain relevant in today's world. Our goal must be to ensure that these arrangements are strengthened, complied with, and fully enforced.

—The proliferation of enrichment and reprocessing technology must be stopped. While terrorist acquisition of an enrichment plant is a low risk, the continuing spread of sensitive nuclear technologies can only create greater opportunities for sub-state actors to acquire weapons materials. Libya, Iran, and North Korea all to one degree or another benefitted from the illicit acquisition of enrichment or reprocessing technologies.

"Nuclear security in today's age of terrorism requires global participation, not just by national governments, but also by police forces, border guards, cities, communities, harbors, research institutes and factories."

Because the U.S. and Russia are the two largest nuclear states, a special burden falls on them to keep nuclear and radioactive materials out of the hands of terrorists, Brooks said.

"Cooperation with Russia on nuclear security will remain a priority for the United States. Cooperative programs have wide support, are well funded, and are a regular discussion item between the U.S. and Russian governments, as was indicated by the recent Joint Statement on Nuclear

Security Cooperation at the Bush-Putin meeting in Bratislava."

Newer programs like the NNSA's Global Threat Reduction Initiative are moving forward to build international support for national efforts to identify, secure, recover, and facilitate the disposition of nuclear and radioactive materials of possible interest to terrorists, he said.

Since last September, this initiative has repatriated fresh HEU fuel from Uzbekistan and the Czech Republic to Russia, initiated regional training programs, and initiated more than ten other joint projects.

"At the opening of the nuclear age, Albert Einstein warned that the advent of nuclear fission had changed everything except the way we think, and thus we drift towards disaster," Brooks said. "Einstein's world of one or two masters of nuclear technology was far different from the one we live in today, in which nuclear science and materials are widely spread, but the risk of disaster remains."

Pantex Plant Wins Pollution Prevention Awards

For the second year in a row, the Pantex Plant has received a Best in Class Environmental Stewardship Award, this time for its environmental partnerships. The Pantex Pollution Prevention Team was honored for its work to raise awareness in the local community through environmental

partnerships. It has initiated recycling partnerships with the City of Panhandle and with Natural Fertilizer Company.

Pantex also recruited and organized area community organizations to sponsor a children's fair for Earth Day 2004 attended by

approximately 700 children and their parents.

The P2 Environmental Stewardship Award was given to Pantex for implementing the use of ethanol-85 and biodiesel fuels for vehicles operated at the plant.

Sandia Group Studies Defenses Against Terrorism

Anticipating attacks from terrorists, and hardening potential targets against them, is a wearying and expensive business that could be made simpler through a broader view of the opponents' origins, fears, and ultimate objectives, according to studies by the Advanced Concepts Group (ACG) of NNSA's Sandia National Laboratories.

"Right now, there are way too many targets considered and way too many ways to attack them," said ACG's Curtis Johnson. "Any thinking person can spin up enemies, threats, and locations it takes billions [of dollars] to fix."

The ACG — a technical think tank that influences the direction of long-term research at Sandia — is in the early stages of developing a conceptual program to improve America's defenses against terrorism.

That U.S. response is actually part of the war plan of our opponents, according to ACG vice president and Sandia Principal Scientist Gerry Yonas. He said a 2004 al Qaeda document said: "Force the enemy to guard every building, train station, and street in

order to plant fear in their hearts and convince Muslims to join and die as martyrs instead of dying as infidels."

"Something to keep in mind," Johnson said, "is that an attack isn't a goal in itself but a means to a further end. The terrorist might succeed at some tactical objective — create terrible destruction and loss of life — yet still be foiled in achieving his strategic goal of bringing our society to its knees."

"Suppose every PDA had a sensor on it, ACG researcher Laura McNamara suggested. We would achieve decentralized surveillance"

These sensors could report by radio frequency to a central computer any signal from contraband biological, chemical, or nuclear material. Danger signals would call forth already-in-place defensive procedures.

People in airports voluntarily might carry smart cards if the cards could be sweetened to perform additional tasks like helping the bearer get through security, or to the right gate at the right time.

Mall shoppers might be handed a sensing card that also would help locate a particular store, a special sale, or find the closest parking space through cheap distributed-sensor networks.

"The goal here is to abolish anonymity, the terrorist's friend. We're not talking about abolishing privacy — that's another issue," said Sandia researcher Peter Chew. "We're only considering the effect of setting up an electronic situation where all the people in a mall, subway, or airport 'know' each other as they would have, personally, in a small town. This would help malls and communities become bad targets."

"Because their goal is to terrorize us, one point is to take the terror out of terror," said John Whitley, another ACG group member. "Consider fire; at one time fire was a major threat to cities and even burned a number of them down. Now we have fire engines, water hydrants, fire insurance. We live with the danger almost without thinking about it. We need to set up the same kind of standby mechanisms against terrorism, and do so in an affordable manner."



ENGINEERS DAY AT LIVERMORE:

Students attending Lawrence Livermore National Laboratory's annual Engineers Day observance examine some gooey slime they produced during a Fun With Science show experiment. About 500 sixth- and seventh-graders participated in the half-day event at the laboratory that included hands-on activities and a keynote address by Jeff Wysoff, lab engineer and former NASA astronaut with three space walks and four shuttle missions to his credit.

NNSA Authorizes Restart of Important Y-12 Facility

The final process in the Y-12 National Security Complex’s ability to produce purified uranium metal is back in operation after being shut down for more than a decade.

Bill Brumley, Y-12 site manager for the National Nuclear Security Administration (NNSA), has given BWXT Y-12, the company that operates Y-12 for NNSA, authorization to restart the oxide conversion facility, a process that converts uranium oxide into a uranium compound called green salt, which is then converted to uranium metal.

Start-up of the oxide conversion facility means that Y-12 has taken the final step to return to full production operations.

“This is an important step. That last piece of the puzzle is now in place. It’s been a lot of hard work by a lot of people, both on the part of my staff and BWXT Y-12. I want to thank every one of them for their dedication

and determination in achieving this important milestone,” Brumley said.

The oxide conversion facility was shut down in 1992 following an accidental release of hydrogen fluoride, a hazardous, corrosive gas. The facility was not part of the September 1994 stand-down in which virtually all operations at Y-12 were halted because of safety concerns raised by the Defense Nuclear Facilities Safety Board.

In the years since it was shut down, a new oxide conversion facility was designed and built incorporating new equipment and state-of-the-art safety systems to contain any potential releases of the material. Authorization for restarting the process followed rigorous training for operators and certification of facilities. Operational readiness assessments were conducted by both internal and external review teams

prior to authorization for restart.

Y-12 recaptures and recycles virtually all of the enriched uranium used in plant operations. Oxide conversion is a key piece of the process through which material is recycled. Other steps that allow the full recycling and recovery of uranium were the reduction pour up operations that resumed in 2001 and wet chemistry operations that restarted in 2004.

Y-12 is a key part of the national nuclear weapons complex. It manufactures parts from uranium and other special materials, specializing in the second stage of warheads. Y-12 also is responsible for the disassembly of warhead components and recycling of usable materials. It is the nation’s storehouse for weapons-usable special nuclear material.

LLNL Demonstrates Terrorist Truck-Stopping Technology

Researchers at Lawrence Livermore National Laboratory recently demonstrated its “next-generation” truck-stopping technology, designed to protect sensitive facilities from terrorists. The technology would automatically disable a truck loaded with explosives or other hazardous materials if it attempted to crash into a facility or building.

The system consists of a shoebox-size, tamper-resistant device that would be mounted onto commercial trucks to automatically activate the vehicle’s brakes, bringing it to a halt. The device could be automatically activated by radio signals from electronic gates protecting sensitive facilities, or from a remote-control

button controlled by facilities’ protective forces or by local law enforcement.

The device would not be interfered with by other radio frequencies, such as a cell phone or other wireless technology, preventing hackers from interrupting signals or purposely setting off the technology.

The remote-control device marks

the fourth generation of the technology.



MEDIA ATTENTION: Reporters and photographers record the introduction of Lawrence Livermore’s “next generation” truck-stopping technology.

LANL Scientist Named Asian American Engineer of The Year

A Los Alamos National Laboratory scientist, widely known for his innovations in the field of electronic materials and high-temperature superconductivity has been named the 2005 Asian American Engineer of the Year by the Chinese Institute of Engineers USA (CIE/USA).

Quanxi Jia, a Laboratory Fellow since September 2003 and currently the device team leader in the Superconductivity Technology Center of the Materials Science and Technology Division, has been honored for his many outstanding scientific and technical achievements.

Jia's fields of expertise are in the growth of metal-oxide films (ferroelectric, ferromagnetic, conductive oxides and high-temperature superconductors), the fabrication of electronic devices, and in the structural/electrical characterization of electronic materials. He is the author/co-author of more than 240 journal articles and nine book chapters. Jia has garnered 22 patents in the fields of electronic materials and devices and has 10 more pending. He is the winner of two R&D 100 awards; the first in 1998 for his underground radio work and the other in 2003 for flexible superconducting tape. In 2000, he received a Laboratory Achievement Award for his accomplishments.

Jia received his bachelors and master's degrees in electronic engineering from Xian Jiaotong University, China, in 1982 and 1985, respectively, and his doctorate from

the State University of New York at Buffalo in 1991. Prior to coming to the laboratory in 1993, he was a lecturer in Xian Jiaotong University and later a visiting associate professor at Kumamoto University in Japan.

The CIE/USA award recognizes



ENGINEER OF YEAR: Chinese Institute of Engineers has named Quanxi Jia the 2005 Asian American Engineer of the year.

established engineers who have made outstanding contributions to the engineering profession, the public welfare and/or the humankind. This is the fourth consecutive year that a Los Alamos scientist has received the award. Last year, Los Alamos computer scientist Wu-chun Feng also received the award. In 2003, Joe Tiee received the award; and in 2002, Los Alamos' Paul Pan was an award recipient.

Jia received his award along with twelve other outstanding Asian-Americans in Whippany, New Jersey at an awards banquet on February 26.

Everet Beckner Resigns DP Post

Dr. Everett Beckner, deputy administrator for defense programs, has resigned from his position effective April 30.

Beckner was nominated by President Bush on September 25, 2001, and confirmed by the Senate on January 25, 2002. His principle responsibility has been to manage the \$6.5 billion program that maintains the stockpile and ensures that the nation's nuclear weapons remain safe, secure and reliable.

"Ev has played a key role in the leadership of NNSA and has served this agency well. He is one of the most dedicated public servants I know," said Administrator Linton Brooks. "He has been a superb custodian of the nation's nuclear weapons stockpile. Ev's departure is a serious loss to NNSA, the Department of Energy and the country."

Before becoming NNSA's deputy administrator for defense programs, Beckner served as the deputy chief executive at Atomic Weapons Establishment (AWE) at Aldermaston, United Kingdom. Before that position, he was the vice president of technical operations and environment, safety and health for Lockheed Martin's Energy and Environment Sector in Bethesda, Md.

Prior to NNSA's creation, Beckner had been the principal deputy assistant secretary for Defense Programs at the Department of Energy (DOE) in Washington, D.C. from 1991-1995. His service at the DOE followed a lengthy career at Sandia National Laboratories in Albuquerque, New Mexico.

Former Intern Moving Up In KC

Mark L. Holecek is living up to one of the objectives of the DOE/NNSA intern program — to attract new talent that will help provide leadership for the NNSA of the future. Currently a manager of the Kansas City Site Office Quality Engineering Program, he has been selected as the site office assistant manager for production and project management (OPPM).

Holecek started his career as an intern and spent several years in OPPM as a program engineer. The intern program is a major means of addressing NNSA's succession planning needs and, along with other entry-level hiring mechanisms, supports the President's human capital initiative.

The former intern will now be responsible for managing the OPPM group of technical engineers, scientists, program managers and support staff for areas such as weapon program management, production management and control and industrial engineering.

Kansas City Site Office Manager Steve Taylor said, "Mark has served KCSO/NNSA/DOE in an outstanding manner for the past thirteen years. Some of his accomplishments include successfully leading a team of engineers in assuring the quality of all production related

activities, developing a risk-based sampling methodology for product acceptance, increasing survey



FORMER INTERN: Mark Holecek of the Kansas City Site Office displays a miniature mechanism built at the Kansas City Plant.

production by an average of thirty-two percent for FY-02 and FY-03, and developing a cost of quality standard for the nuclear weapons complex.”

Holecek is a Six-Sigma black belt. Six Sigma is a rigorous methodology that uses data and statistical analysis to measure and improve a company's operational performance by identifying and eliminating “defects” in manufacturing and service-related processes. A black belt is a project team leader who is responsible for implementing process improvement projects.

He has a metallurgical engineering degree from the University of Pittsburgh and an engineering management degree from the University of Kansas.

Y-12's Williams To Lead Inter-Laboratory Board

Ken Williams, of the Y-12 National Security Complex, is the new head of the Inter-Laboratory Board (ILAB) which supports efforts to find peaceful commercial enterprises for scientists in the former Soviet Union who were involved in nuclear weapons production activities.

The ILAB, consisting of representatives from 11 DOE national laboratories and production facilities, is a major component of the Initiatives for Proliferation Prevention (IPP) program. Through cooperative projects among former Soviet weapons scientists, U.S. national laboratories and U.S. industry, the IPP program identifies non-military, commercial applications for former Soviet institute technologies. These partnerships provide new resources and markets for U.S. companies, while establishing important private sector linkages for former soviet weapons scientist and engineers.

“The Inter-Laboratory Board serves as an intermediary for U.S. industry partners who may be working in Russia for the first time, Williams said. By evaluating the capabilities of former soviet institutes and conducting project-related research and technology development, the board plays a pivotal role in the success of individual projects and in the IPP program as a whole.” Williams has been program manager for both the IPP program and the Nuclear Cities Initiative (NCI) at Oak Ridge for the past five years.

Got an article for the NNSA Newsletter?
 Submit it for consideration to
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