



U.S. Department of Energy Chicago Operations Office



Fiscal Year 2002 Accomplishments and Financial Summaries Report



Department of Energy

Chicago Operations Office
9800 South Cass Avenue
Argonne, Illinois 60439

JUN 19 2003

Customers and Stakeholders

**SUBJECT: THE CHICAGO OPERATIONS OFFICE (CH) FISCAL YEAR (FY) 2002
ACCOMPLISHMENTS AND FINANCIAL SUMMARIES REPORT**

Enclosed is the Fiscal Year 2002 Accomplishments and Financial Summaries Report. This report summarizes the results achieved by the Chicago Operations Office and our management and operating contractors in support of the Department of Energy's varied and challenging missions. Included in the report are FY 2002 Financial Summaries that provide an overview of the status of funds managed by our organization.

The following are some highlights of our FY 2002 accomplishments:

- successfully managed over 2,900 contracts and assistance instruments
- received the 2002 Heroes Award for efforts in workforce strategies and systems
- exceeded spent nuclear fuel treatment goals ahead of schedule
- conducted R&D 100 award-winning research
- had the first federally owned building to achieve the "silver" rating from the U.S. Green Buildings Council for Leadership in Energy and Environmental Design (LEED)
- made discoveries and advances in many fields, including homeland security and biomedicine, materials science, earth science, and bioscience
- used nanoscale materials to develop new methods for making electrodes
- conducted research to identify nuclear and radioactive threats throughout the world
- filed twenty-two patent applications on behalf of the Government
- cited for model project management of the large international U.S. Large Hadron Collider project
- received the 2002 DOE Training and Development Excellence Award
- provided leadership and support to the SC Model Contract initiative
- received the DOE Information Technology (IT) Quality Award for management and administrative excellence
- successfully managed the FY 2002 completion of the decontamination and decommissioning of a major fusion research reactor on time and under budget

We hope that this report will be a useful guide in helping you understand CH's contributions in meeting the challenges of the Department. We value your feedback. If you have any comments or questions about this report, please contact Tom Foley at (630) 252-2414.

Marvin E. Gunn, Jr.
Manager

Enclosure:
As Stated



Purpose

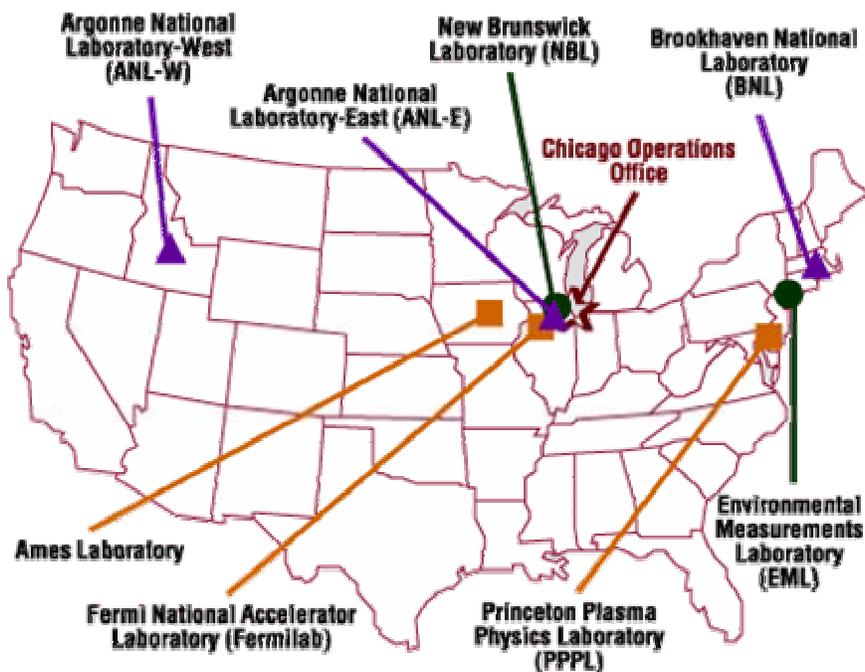
The purpose of this report is to demonstrate to our customers and stakeholders how the Chicago Operations Office (CH) continues to be a successful partner in supporting the Department of Energy's (DOE's) mission areas of Science, Energy Resources, National Nuclear Security, and Environmental Quality. As an organization, we are a technical and business management team whose purpose is to advance DOE's mission through managing programs, projects, facilities, and contracts.

This report represents a summary of our activities relative to DOE's mission. It demonstrates our successes by highlighting some of the most significant accomplishments in Fiscal Year (FY) 2002.

Background

CH oversees five Management and Operating (M&O) contractors and two Government-Owned and Government-Operated (GOGOs) laboratories who operate world-class research facilities. We are one of the Department's most geographically dispersed Operations Offices with facilities located from Idaho Falls, Idaho, to Upton, New York.

Chicago Facilities



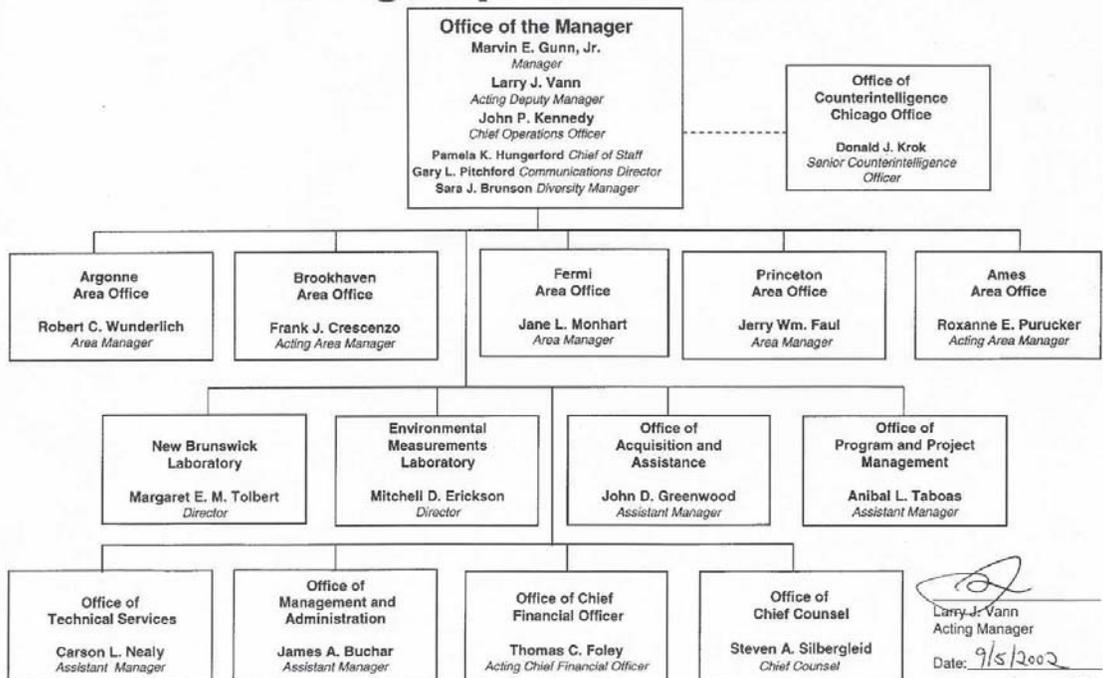
Our sites perform work to advance the Department's mission, plus corporate management support activities. CH leverages the efforts of approximately 400 Federal employees to manage work funded by approximately \$2 billion of new budget authority each year and almost \$3 billion in net assets. Our FY 2002 staffing, funding and other information is as follows:

	<u>Federal Staffing</u>	<u>Contractor Staffing</u>	<u>Funding (\$M)</u>
Energy Resources	13	845	\$195,291
National Nuclear Security	45	397	227,870
Environmental Quality	75	288	64,260
Science	267	7,126	1,472,663
Work for Others		13	160,579
Corporate Management	—	<u>752</u>	<u>6,495</u>
Total	<u>400</u>	<u>9,421</u>	<u>\$2,127,158</u>

General Information

Land (acres)	16,208
Building Space (gross sq. feet)	12,860,420
Number of Buildings	933
States with Facilities	5
Congressional Districts	65
Population Affected	44.2 million

Chicago Operations Office





FY 2002

Accomplishments

Office of Acquisition and Assistance (ACQ)

Award and Administration Excellence

ACQ awards and administers approximately 36% of DOE's financial assistance actions (Cooperative Agreements and Project Grants). In FY 2002, our total workload consisted of approximately 2,190 active awards, 990 inactive awards, and over 2,825 procurement requests were processed. The Office of Science (SC) is by far the predominant customer for ACQ, comprising approximately 90.5% of our active awards (1,979) and 65.5% of dollars obligated (\$467 million), exclusive of Management and Operating contracts. Approximately 74.5% of awards made were to Educational Institutions and non-profit organizations, and 15.9% to small businesses. Timely awarding of SC grants and cooperative agreements was a primary goal for our organization, and based on tracking 1,300 procurement requests, 89% were awarded by the desired award date. If delays beyond ACQ's control were excluded, *on-time awards were 98%*. Another goal that was set for FY 2002 included a target of closing out 360 inactive awards. ACQ closed out 504 awards and exceeded the agency's balance score card objective of a 10% reduction in "old dogs" (inactive awards that have exceeded their lead-time for closeout). For award data being reported into the Procurement and Assistance Data System (PADS), 93.8% of awards were reported in less than eight days (*a best-in-class record*).

Based upon our expertise, ACQ was chosen to provide contractual support for the National Nuclear Security Administration's Offices of Fissile Materials Disposition and Strategic Materials and Transportation, having had extensive experience with high profile, large and complex procurements. Currently, ACQ provides support for the Mixed Oxide Fuel Project (MOX), Plutonium Disassembly and Conversion Facility Project (PDCF), Irradiation Services, Tritium Producing Burnable Absorber Rods (TPBAR), and Transportation Services. ACQ has been approached to provide procurement support for several additional major activities in support of the Office of Fissile Materials Disposition.

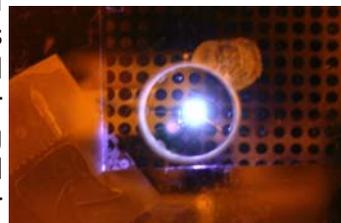
Ames Area Office (AMES)

In addition to the routine oversight conducted by AMES of the contract with Iowa State University for the operation of Ames Laboratory, several items are of note during the past year. AMES coordinated a visit by Secretary Abraham to the Laboratory. He was accompanied by U.S. Representative Tom Latham while they visited the Midwest Forensics Resource Center and toured homeland security and forensics research activities. AMES provided significant guidance and input to the Laboratory regarding their Integrated Safety Management System (ISMS). The improved ISMS correlates directly to significant reductions in the accident/injury rate and lost workdays for the Laboratory. During a year that was marked by challenges to meet new security requirements, AMES worked closely with the Laboratory to develop an Integrated Safeguards and Security Management System and site security plans graded to site needs for increased security with limited resources. AMES also worked with the Laboratory to establish the changes required for documenting foreign visitors and assignees.

Ames Laboratory

The recently established Midwest Forensics Resource Center (MFRC), a cooperative effort of the Ames Laboratory and crime laboratories in an eight-state region, received \$3 million in federal funds from the National Institute of Justice. MFRC's mission includes conducting research and development assistance to improve forensic capabilities, providing forensic training assistance for crime-lab scientists and law-enforcement professionals, providing casework assistance for crime labs and educating the next generation of forensic scientists. The center serves crime laboratories in Iowa and several surrounding states, including Wisconsin, Minnesota, North Dakota, South Dakota, Nebraska, Kansas, Missouri and Illinois. It also collaborates with several high-level government agencies, including the Bureau of Alcohol, Tobacco and Firearms; the FBI; the Department of Justice's National Institute of Justice; and DOE.

Scientists at Ames Laboratory, in collaboration with scientists at the University of Michigan, Ann Arbor, developed and demonstrated a novel, fluorescence-based chemical sensor that would be more compact, versatile and less expensive than existing technology of its kind. The integrated organic light-emitting device, or OLED, fluorescent chemical sensor holds promise for myriad potential applications, such as monitoring oxygen, inorganic gases, volatile organic compounds, biochemical compounds and biological organisms. Within the field of molecular diagnostics for biomedical and biochemical research, the sensor could be used for point-of-care medical testing, high-throughput drug discovery, and detection of pathogens and other warfare agents.



Researchers at Ames Laboratory are fostering and expanding a computational chemistry code that provides extensive and detailed information about how things work on the molecular scale. The General Atomic and Molecular Electronic Structure System, known as GAMESS, has nearly 10,000 users worldwide and includes a hierarchy of quantum chemistry methods that helps solve problems relating to molecules, making possible the design of new fuels and optical materials and the development of coatings that are resistant to extreme environments.

Researchers at Ames Laboratory have found a way to combine organic materials in solid state without the use of solvents. This revolutionary solvent-free process, which uses mechanical ball-milling to carry out reactions, means that environmentally harmful solvents, such as benzene, dichloromethane and others, could be removed from many of the chemical processes used to produce millions of consumer and industrial products.



Argonne Area Office (AAO)

AAO successfully obtained a State of Idaho Resource Conservation and Recovery Act (RCRA) Permit for the Experimental Breeder Reactor-II (EBR-II) Complex sodium systems. EBR-II is the only defueled reactor facility undergoing RCRA closure. AAO also obtained a State of Idaho RCRA Permit modification to allow expanded storage of mixed waste in the Sodium Storage

Building. This expansion makes possible the closure of the Outdoor Radioactive Storage Area. Argonne National Laboratory (ANL) exceeded the Presidential goal of treating 500 kilograms of sodium-bonded spent nuclear fuel by over 100 kilograms, and the effort was completed six weeks ahead of schedule. EBR-II closure was completed on schedule (March 2002) and within budget.

AAO prepared and obtained DOE approval of the Safety Assessment for the Zero Power Physics Reactor (ZPPR) Radioisotope Thermoelectric Generators (RTG) storage program, and successfully placed the units into monitored storage. Preparing the Safety Assessment included upgrading the ZPPR cell to a Hazard Category 2 non-reactor nuclear facility, completing facility modifications, preparing procedures and training personnel, and completing the Operational Readiness Assessment.

AAO has further developed the Performance-Based provisions of the prime contract with the University of Chicago to incorporate a "systems-based" strategy to Management and Operating (M&O) contractor management during FY 2002. Consistent with this approach, the following Argonne National Laboratory (ANL) Systems were validated during FY 2002: Procurement System, Human Resources Compensation System, Personal Property System, and High-Risk Property System.

Argonne National Laboratory (ANL)

Advanced Photon Source (APS)

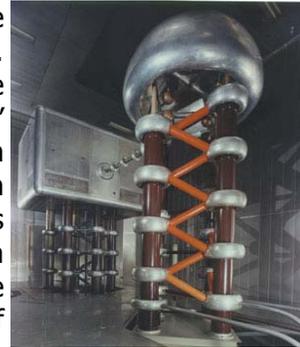
Scientists and students from throughout the U.S. used the APS to make discoveries and advances in many fields. For example:

- Homeland Security and Biomedicine: Solved the three-dimensional structure of edema factor, one of the three toxins that makes anthrax so deadly. This finding is a crucial step toward designing drugs to block the harmful effects of anthrax and perhaps other bacterial toxins.
- Materials Science: Created the first reported image of antiferromagnetism within a solid. Researchers used magnetic x-ray diffraction and x-ray focusing optics to image magnetic activity in a single chromium crystal at the micron scale. These techniques could lead to a better understanding of applications of antiferromagnetism to new technologies, such as low-cost magnetic recording.
- Earth Science: Found experimental evidence suggesting that the earth's inner core consists largely of two exotic forms of iron instead of only one. The existence of two forms of iron could influence the interpretation of seismic data about the core.
- Bioscience: Solved the molecular structure of a protein that plays a central role in interbacterial communication. This work could lead to new drugs to fight such diseases as cystic fibrosis and bubonic plague, as well as to new technologies for environment-related processes such as water filtration.

APS scientists and engineers have developed a way to extract two separate x-ray beams from a single straight section in the accelerator, effectively doubling the number of experiments that can be performed simultaneously on a beamline. This is particularly important in the field of macromolecular crystallography, where high experimental throughput is a great advantage.

Intense Pulsed Neutron Source (IPNS)

Research at IPNS has led to the discovery of new forms of ice which lie between the previously known high- and low-density amorphous forms. The new metastable states are formed through a slow relaxation of the high-density amorphous phase, which is made by squeezing “regular” ice to 13,000 times atmospheric pressure in liquid nitrogen. Although these new forms of ice do not occur naturally on earth, they may exist in the colder regions of the galaxy. The IPNS results challenge predictions of some current theories, such as the widely believed conjecture that a second critical point may exist in water. The work may also have practical implications in other fields such as cryopreservation of biomolecules.



Argonne Tandem Linac Accelerator System (ATLAS)

Researchers at ATLAS have made precise measurements of the masses of ^{68}Se , ^{68}As , and ^{68}Ge . These nuclear masses are especially important for understanding the nuclear physics process whereby heavy elements are created. These masses help determine the path of rapid proton capture process thought to occur on the surface of accreting neutron stars, which in turn will provide a better understanding of the time structure of the observed X-ray bursts.

R&D 100 Awards

Three technologies developed by ANL staff and collaborators won R&D 100 Awards for 2002:

- **Globus Toolkit™ 2.0** is a set of software services and libraries that support computational grids, which allow geographically and organizationally dispersed computers, data storage systems, scientific instruments, and collaborators to work on the same problem at the same time. The toolkit is the basis of many science and engineering projects world-wide, including the National Science Foundation (NSF) TeraGrid, and a number of major computer vendors are involved in development of commercial applications. ANL and the University of Southern California have led the multi-institutional Globus R&D project since 1996. The Globus Toolkit also won an “Editors’ Choice” award for “most promising new technology” among this year’s R&D 100 winners.
- 
- The **Smart Sensor Development Kit**, developed by ANL and General Atomics Corp., is a toolkit that allows users to quickly adapt combinations of microsensors and software to new chemical sensing applications. The microsensors employ films of metal oxide particles that are highly sensitive to specific chemicals in gaseous form. To date, the technology has been commercialized in fire detectors, a device to detect termite infestations, and a personal monitor for detecting toxic gases, including cyanide-containing gases.

- The **Advanced Electrodeionization Technology for Product Desalting**, developed by ANL and EDSEP, Inc., improves on current methods for removing low concentrations of salt and other impurities from finished products. By combining the selectivity of current commercial ion exchange technology with the efficiency of electro dialysis, the inventors arrived at a process that matches the performance of ion exchange methods at considerably lower cost and with a more than 50% reduction in the waste stream.

ANL's Central Supply Facility (CSF) was the first federally owned building to achieve the "Silver" Rating from the U.S. Green Buildings Council for Leadership in Energy and Environmental Design (LEED). The CSF exemplifies the bold and innovative application of cost effective life-cycle techniques and solutions. ANL completed the CSF project well within the original baseline.



Brookhaven Area Office (BAO)

BAO successfully negotiated the extend option for the Brookhaven Science Associates (BSA) prime contract. BAO also served as a member of the SC working group for the development of a model contract for SC laboratories. The working group drafted and gained approval of the "Card Principles" which are the basis for the SC model contracts.

Radiological Assistance Program

The BAO Radiological Assistance Program (RAP) has provided high priority, high visibility support to Federal, State and Local organizations throughout 2002. The RAP provided an energetic response to the President's direction to "confront tough problems". The people at BAO, and Brookhaven National Laboratory (BNL) supporting the RAP, rise to meet national security challenges daily by demonstrating great personal skill, unquestionable reliability and effectiveness. As recently stated by the DOE Office of Emergency Response "The BAO RAP has set the example for all emergency responders to follow and reflects the highest credit upon the DOE."



Brookhaven National Laboratory (BNL)

A Method for Producing Electrodes Using Nanoscale Materials

Using nanoscale materials, researchers from BNL have developed a method to make electrodes that are suitable for use in rechargeable lithium ion batteries and other electronic devices. Because so many new and different materials can be made with this versatile method, it should be capable of producing electrodes that are more efficient and durable than those in use today.



Among the advantages of the new method as it applies to lithium ion batteries are that lithium alloys can be produced ex situ rather than by an initial activation process inside the battery. This makes the battery production process simpler and less time consuming. Most importantly, the method allows great flexibility in choice of materials and makes possible the production of novel alloy compositions.

DOE Nanocenter at BNL

The Brookhaven Area Office successfully guided BNL to obtain approval of Critical Decision-0 (CD-0) "Approve Mission Need" for the Center for Functional Nanomaterials (CFN). DOE Secretary Abraham personally announced the approval of the \$85 million facility during his visit to BNL in June 2002. The CFN will be the focal point and enabler of advanced materials research in the northeastern United States. CFN, a 85,000 square foot of laboratory/office space with state-of-the-art capabilities for nanoscale research and expert scientific/technical support staff compliments the other five DOE nanocenters. These centers will greatly enhance scientists' ability to investigate the effects of nanoscale dimensions on material properties by providing new fabrication techniques and other experimental tools.



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Sensitive Measurement by the Sudbury Neutrino Observatory (SNO) Observes Solar Neutrinos in a New Way

A team of scientists from Canada, the U.S. and the United Kingdom announced the results of a unique new measurement of the total number of all known neutrino types reaching the earth from the sun. Using data entirely from the Sudbury Neutrino Observatory (SNO) in Canada, they were also able to determine that the observed number of electron neutrinos (the type produced by the sun) is only a fraction of the total number. This shows with great certainty that neutrinos from the sun change from one type to another before reaching the earth.



Collaborating Institutions include—from Canada: Queen's University, Carleton University, Laurentian University, University of Guelph, University of British Columbia, Chalk River Laboratories (to 1996). From the U.S.: Lawrence Berkeley National Laboratory, Los Alamos National Laboratory, University of Pennsylvania, University of Washington, Brookhaven National Laboratory, Princeton University (to 1992), University of California at Irvine (to 1989). From the U.K.: Oxford University.

Office of Chief Counsel (OCC)

OCC has been instrumental in providing invaluable leadership and support to the SC Restructuring and Reengineering Project by leading the SC Model Contract Initiative and CH's development of the proposed To Be Condition for an SC Service Center.

OCC provided significant legal support to the Area Offices in the administration and oversight of the M&O contracts. Specifically, we were successful in negotiating a major interim modification

to the BNL contract and providing important support to the decision to exercise the option to extend the contract.

As the DOE Center of Excellence for Intellectual Property, OCC provided complete and outstanding intellectual property law support to the entire CH complex, as well as to the Golden Field Office, Idaho National Engineering and Environmental Laboratory (INEEL), Rocky Flats Field Office and the Ohio Field Office in the negotiation, administration, and execution of M&O contracts for the National Renewable Energy Laboratory, INEEL, Rocky Flats, West Valley, Fernald and Mound. The Intellectual Property staff continued to protect the government's interest in Intellectual Property, and improved the potential for further development and commercialization by filing 22 patent applications on behalf of the government.

OCC provided significant legal support and assistance to AAO and BAO in order for them to meet their enforceable regulatory milestones for environmental restoration activities. We provided valuable insight in the NEPA review process for Chicago projects, including the Remote Treatment Facility, Rare Isotope Accelerator, and Congressionally-mandated construction grants and assisted in developing third-party financing opportunities for both ANL and BNL.

Office of Chief Financial Officer (CR)

CR successfully managed a \$2.1 billion budget contained in 20 different appropriation accounts and several hundred programs. All of the monthly budget and accounting reporting requirements were met. Financial operations supporting programs and projects were run smoothly during a lengthy continuing resolution period.

In addition, CH was one of the few Departmental Elements that received a clean opinion with no material recommendations or findings on CH's financial statements. CR converted 100% of eligible CH grantees from invoice payments to automated payment and also provided timely and accurate cost/price assistance for several hundred actions, including awards and closeouts. CR staff participated in several DOE initiatives and committees, including the DOE Budget Results Council, the DOE Financial Management Career Council, and the A-76 Performance Work Team.

Environmental Measurements Laboratory (EML)

EML carries out research and development of field and laboratory based advanced analytical instruments and technologies, coupled with current techniques in sample collection and analysis and data reduction, to identify nuclear and radioactive threats throughout the world, and to provide advice and consultation on environmental measurements and signatures.

In FY 2002, EML installed a homeland security monitoring platform on its roof in New York City, supporting a suite of instruments to provide vital information in the event of a terrorist attack. Among these is the Comprehensive Radiation Sensor (CRS) developed by EML. The CRS is a unique, low-cost gamma radiation detector that can easily distinguish anthropogenic fission and activation from natural radiation. The CRS responds within two seconds of detecting an elevated radiation level, alerting nearby personnel and sending out a network alarm, which can allow immediate intervention. The



instrument operates automatically and unattended 24/7. This set of measurement instrumentation, mounted on an 8 ft. by 10 ft. modular aluminum platform, is the first node in an envisioned network of sensors throughout New York City and all over the United States. This network would guide our nation's response to a nuclear or radiological attack by providing real-time information to federal, state and local officials on the location, movement and level of radioactive contamination. The platform could also easily accommodate sensors for chemical and biological agents.

As federal technical experts, EML supports Environmental Management cleanup and closure activities at DOE sites by demonstrating and deploying advanced radiological measurement and survey methods.

A principal contaminant of concern in soil at the Miamisburg Environmental Management Project (MEMP) is ^{238}Pu . Cleanup criteria require the measurement of this nuclide at levels of 50 pCi/g which is beyond the capabilities of a FIDLER, the normal instrument used for Pu scans in the field. To achieve the required measurement sensitivity, EML has championed the use of Xe-filled Large Area Proportional Counters (LAPC) operated as x-ray spectrometers in the energy range of 10 to 30 keV. In FY 2002, EML teamed with the Idaho National Engineering and Environmental Laboratory (INEEL) to demonstrate this technology at the MEMP. EML's LAPC was configured by INEEL in a mobile scanning system featuring Global Positioning System and software mapping capabilities similar to the mobile gamma-ray spectrometry platforms developed for the FEMP (formerly known as the Feed Materials Plant).



Fermi Area Office (FAO)

U.S. Large Hadron Collider (LHC) Construction Project

The U.S. LHC is being built at the European Laboratory for Particle Physics (CERN) outside Geneva, Switzerland and will begin operations later this decade. The U.S. LHC Construction Project is comprised of U.S. efforts supporting construction of the LHC accelerator and its two massive particle detectors, called CMS (Compact Muon Solenoid) and ATLAS (A Toroidal LHC ApparatuS). FAO manages this \$531 million construction project on behalf of DOE and the National Science Foundation. The work is being conducted at multiple national laboratories and universities, with Fermilab serving as the lead laboratory. The project progressed from 62% complete to 70% complete in FY 2002. The project continues to meet its goals, and the U.S. remains a reliable and influential partner in the construction of the CMS and ATLAS detectors and the LHC machine. The management of this project by FAO and the Fermi National Accelerator Laboratory (Fermilab) was cited by a 2002 DOE Program Review Committee as "a model to be followed by others."



MiniBooNE

FAO completed an operational readiness review of the MiniBooNE detector and approved start of operations. The detector and its associated new beam line and detector hall were constructed on time and within budget. The MiniBooNE experiment will either confirm or refute experimental results reported by a group of scientists at Los Alamos National Laboratory. These results showed that neutrino antiparticles had transformed into another type of antineutrino, a process called neutrino oscillation. MiniBooNE beam operations were successfully established and neutrino events are being observed.

Wilson Hall

A \$20 million project to restore Wilson Hall, a 17-story reinforced concrete building that principally houses office space, was completed on time and on budget. FAO provided federal project management services, including safety oversight, for this project.

Fermi National Accelerator Laboratory (Fermilab)

Neutrinos at the Main Injector (NuMI)

The NuMI will provide Fermilab a high-intensity neutrino beam for experiments that will explore the question of whether neutrinos are, in fact, massless or actually have a small mass. Fermilab will use the Main Injector to create a beam of muon neutrinos aimed through the earth to the Main Injector Neutrino Oscillation Search (MINOS) experiment, a detector deep underground at the Soudan Underground Laboratory, in a former iron mine in Northern Minnesota. On December 20, 2001, the NuMI project was re-baselined which increased the Total Project Cost (TPC) by \$32.1 million to \$171.4 million and changed the start of operation by two years to September 2005. On September 10, 2002 Fermilab awarded the Surface Buildings and Outfitting subcontract to Ragnar Benson, Inc. for the construction of two service buildings and services for the underground tunnel and halls. The far detector for MINOS, located at Soudan, Minnesota completed the construction of the first super module.



Collider Detector at Fermilab (CDF) and D-Zero Detectors

The upgrades for these detectors were successfully completed and the collaborations from each detector presented their first physics results of Run II at the July 24-31, 2002 International Conference on High Energy Physics. FAO and Fermilab are now preparing for the upgrades that will be necessary to carry the detectors to the end of Run II of the Tevatron. Fermilab prepared all necessary baseline documentation for these upgrades, and FAO was successful in obtaining Critical Decisions 1 (Approve Preliminary Baseline Range), 2 (Approve Performance Baseline), and 3A (Approve Limited Start of Construction).

Management and Administration (MA)

Human Resources Services (HRS)

CH received the *2002 HEROS (Heroic Efforts in Reshaping and Restructuring Organizational Workforce Strategies and Systems in Human Resources) Award* for the development of a Senior Executive Service (SES) crediting plan, without the use of technical qualifications, using Executive Core Qualifications. This plan allowed a more flexible approach as well as a plan to attract more highly qualified candidates in filling SES positions. The Office of Personnel Management (OPM) was so impressed with this crediting plan that they made minor modifications and reissued it as a *Rating Guide* they have shared with other Federal agencies.

The *Guide* provides Federal agencies with an alternative method for assessing candidates, and streamlines the recruitment process for SES positions. OPM recently unveiled a plan for agencies to fill positions within 30 days of the closing date of the vacancy announcement. This *Guide* is one tool to be used in expediting the process.

The CH Employee Development Team received the *2002 Training and Development Excellence Award*. This award recognizes outstanding contributions to the Training and Development Programs of DOE either by an individual employee or by a team of employees. Recipients of this award have consistently provided the highest standard of service to DOE in the field of Training and Development.

Information Management Services (IMS)

CH received the *DOE Information Technology (IT) Quality Award* for Management and Administrative Excellence for the development of a strategic five-year Information Architecture Plan (IAP) and continued use of the process to annually update the plan to meet the needs and priorities of the office. The Information Architecture Team, using the Enterprise Architecture Planning (EAP) Methodology, began the initial six-month phase of this process that culminated in a five-year IAP. The methodology prescribed office-wide participation of business experts to align business needs and strategic goals with information technology planning. Development of the CH Strategic Plan for Information Management was based upon the creation of a series of architectures and models, which consisted of: Principles for Information; Business; Information Resources Catalog (IRC); Data Architecture; Applications Architecture; and Technology Architecture.

Performance Management Services (PMS)

Based on the team's expertise and knowledge in the area of M&O Contracts, SC has relied upon this group to play an active role in the SC Model Contract Initiative by performing research and drafting proposed clauses for the model contract. PMS also provided key recommendations to the Office of Management, Budget and Evaluation/CFO on several new DOE procurement policy initiatives. In addition, PMS played a critical role in providing support for contract extension activities associated with BNL.

During FY 2002, PMS played an important role in drafting a new Laboratory Research and Development Guide for local use at CH. PMS is currently in the process of developing a new

Management Decision Support System that will provide management with important measures and statistics with which to make key decisions for improving CH's productivity and efficiency.

New Brunswick Laboratory (NBL)

NBL's Nuclear Safeguards and Nonproliferation Support Cadre performed assistance/assessment activities in support of DOE-HQ and DOE Field Offices in FY 2002. These assistance/assessment activities were provided: Hanford Survey, Rocky Flats Environmental Test Site Survey, Savannah River Site Surveys, Office of the Inspector General Audit, Portsmouth Gaseous Diffusion Plant Survey, data analysis for Performance Demonstration Project (involved four sites and DOE-HQ), Anomaly-Focused Data Analysis for SO-62, Central Training Academy Training Course Assistance, and a DOE Technical Standard—Measurement Methods Compendium was prepared.

NBL shipped 94% of the Certified Reference Material (CRM) orders received in FY 2002 to customers in FY 2002. NBL provided CRM's to meet the instrument calibration needs and assure accurate nuclear material inventory measurements at domestic and international nuclear facilities. During FY 2002, NBL issued two replacement CRM's, CRM 115 (Depleted Uranium Metal Assay Standard), and CRM U005-A (Uranium Isotopic Standard).

NBL also hired a new Measurement Evaluation Program (MEP) Manager who ensured that all MEP materials, used to monitor performance and reliability of routine safeguards sample analyses, were prepared, packaged, and sent to domestic and international facilities; annual MEP reports were brought up-to-date and issued to customers; and enhancements made to program reporting (i.e., electronic reporting started from Y12 and Portable Document Format files of MEP reports and meeting minutes were prepared). The MEP Annual Meeting was held at the Institute for Nuclear Materials Management Meeting in Orlando, Florida in June 2002; the meeting minutes have been compiled and a Journal of Nuclear Materials Management (JNMM) article is under review by the editors for incorporation into the winter issue of JNMM.



Office of the Manager—Communications (OM-C)

During FY 2002, the CH Web Site was recognized with an *Award of Merit* from the Society for Technical Communication Chicago Chapter. OM-C and Argonne Media Services received the award as co-contributors.

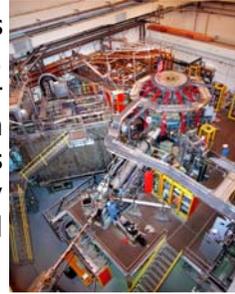
Princeton Area Office (PAO)

PAO successfully managed contractor operations at Princeton Plasma Physics Laboratory (PPPL). Through their efforts, Princeton Plasma Physics Laboratory (PPPL) was able to meet or exceed many of their operational and plasma physics goals. They also managed the FY 2002 completion of the Decontamination and Decommissioning (D&D) of the Tokamak Fusion Test Reactor, a significant D&D effort, on time and under budget.

Princeton Plasma Physics Laboratory (PPPL)

National Spherical Torus Experiment (NSTX)

NSTX produces a plasma that is shaped like a sphere with a hole through its center, different from the "donut" shaped plasma of conventional tokamaks. This innovative plasma configuration may have several advantages, a major one being the ability to confine a higher plasma pressure for a given magnetic field strength. Since the amount of fusion power produced is proportional to the square of the plasma pressure, the use of spherically shaped plasma could allow the development of smaller, more economical fusion reactors. The NSTX Research Team is comprised of 21 U.S. institutions, including universities, national laboratories, and industry.



From the outset, NSTX has met or surpassed many of its operational and physics goals ahead of schedule, including values of plasma current, toroidal and poloidal beta. Toroidal beta is the ratio of the average plasma pressure to the toroidal magnetic field pressure. Poloidal beta is the ratio of the plasma pressure to the pressure of the magnetic field produced by the plasma current. Higher betas mean that greater plasma pressure, thus substantially more fusion power, is achieved with given magnetic field strength. In June 2002, NSTX produced a plasma toroidal beta of 35%. This bodes well for the eventual attainment of theoretically predicted values in the range of 40%. Also during 2002, NSTX achieved a doubling of the poloidal beta ratio from 0.7 to 1.4 beta. The poloidal beta ratio is the ratio of plasma pressure to the poloidal magnetic pressure. A high poloidal beta ratio is important for an attractive spherical torus reactor running steady-state.

Other major NSTX goals include the attainment of non-inductive plasma startup and the production of self-sustained plasmas. The record beta values, coupled with several plasma pressure and stability achievements during 2002, are allowing dramatic progress toward these primary NSTX goals. The development of several new operational techniques and physics insights by the NSTX Research Team has been crucial to the progress so far.

TFTR Decontamination and Decommissioning

In September 2002, the dismantling and removal of the Tokamak Fusion Test Reactor (TFTR) was completed on schedule and under budget. TFTR was shutdown in 1997 following 15 years of outstanding performance, including a world-record fusion power production of 10.7 million watts, and a world-record plasma temperature of 514 million degrees Celsius.



Work on the removal of TFTR began in October of 1999. The experiment stood 24-feet tall with a diameter of 38 feet. It contained an 80-ton donut-shaped vacuum chamber, 587 tons of magnetic field coils, a 15-ton titanium center column, and a massive stainless-steel support structure. TFTR's use of a fuel mixture containing tritium, a mildly radioactive form of hydrogen, added to the challenge of its safe and environmentally sound removal.

The most challenging aspect of the TFTR disassembly was the segmentation of the 100-cubic yard vacuum vessel. Use of conventional technologies such as abrasive sawing and flame cutting could not satisfy health and safety concerns. PPPL's engineering team effectively addressed all challenges by developing an innovative system — Diamond Wire Cutting used in conjunction with a concrete filling technique — which reduced worker radiation exposure, airborne emissions, and waste generation.



Office of Program and Project Management (PMO)

PMO supported the DOE Office of Science (SC) in preparation of a formal response to the Congressional request for an implementation plan for transition to external regulation at the DOE non-defense laboratories. A comprehensive and high quality report was completed and submitted to SC; a modified corporate DOE report was submitted to Congress.

PMO supported the Assistant Deputy Administrator for Fissile Materials Disposition (NA-26) within the National Nuclear Security Administration (NNSA). NA-26 is responsible for all DOE activities relating to the management, storage, and disposition of fissile materials from weapons and weapons systems that are excess to the national security needs of the United States. The key specific objectives of the program are:

- Reduce the large costs associated with the storage of surplus U.S. plutonium;
- Dispose of 50 metric tons of surplus U.S. plutonium; and
- Prevent the risk of theft or diversion of surplus Russian plutonium—permanently (non-proliferation, not arms control).

The Special Programs Team has supported NA-26 in the planning, acquisition and management of two large projects, the Mixed Oxide (MOX) Fuel Program and the Pit Disassembly Conversion Facility (PDCF), which support the overall goals of the program. Project baseline and contract changes were implemented which were necessary to support decisions by the National Security Council to move ahead with the Plutonium Disposition Program, including:

- Completion of 30% of Final Design of MOX Fuel Fabrication Facility (MFFF);
- Completion of PDCF preliminary design; and
- Completion of rebaseline of MFFF and PDCF change proposals and associated contract modifications.

Continued environmental management clean-up activities at ANL-East and BNL. Maintained schedules for remediation of contaminated groundwater, soil and sediment with the start up of Brookhaven Operable Unit III Middle Road groundwater remediation system and initiation of construction of two groundwater treatment systems at BNL. Work on the long-term environmental management program was completed on schedule and within the approved baseline.

PMO also provided key support to DOE's Energy Efficiency and Renewable Energy Program. The Organic Rankine Cycle (ORC) Technology Development Task was completed as planned.

The project has moved into commercial development. The ORC prototype is fully integrated with a turbine using a novel diverter valve. Testing of the ORC integrated with a gas turbine confirmed a net power output of 11 kW and a five percent increase in electrical conversion efficiency. Work managed by CH also paved the way to the first successful introduction of silicon-based ceramic components (combustion liners) in gas turbine engines. The use of silicon-based ceramics has the potential to revolutionize gas turbine engine technology.

Office of Technical Services

Safeguards and Security Services (SSS)

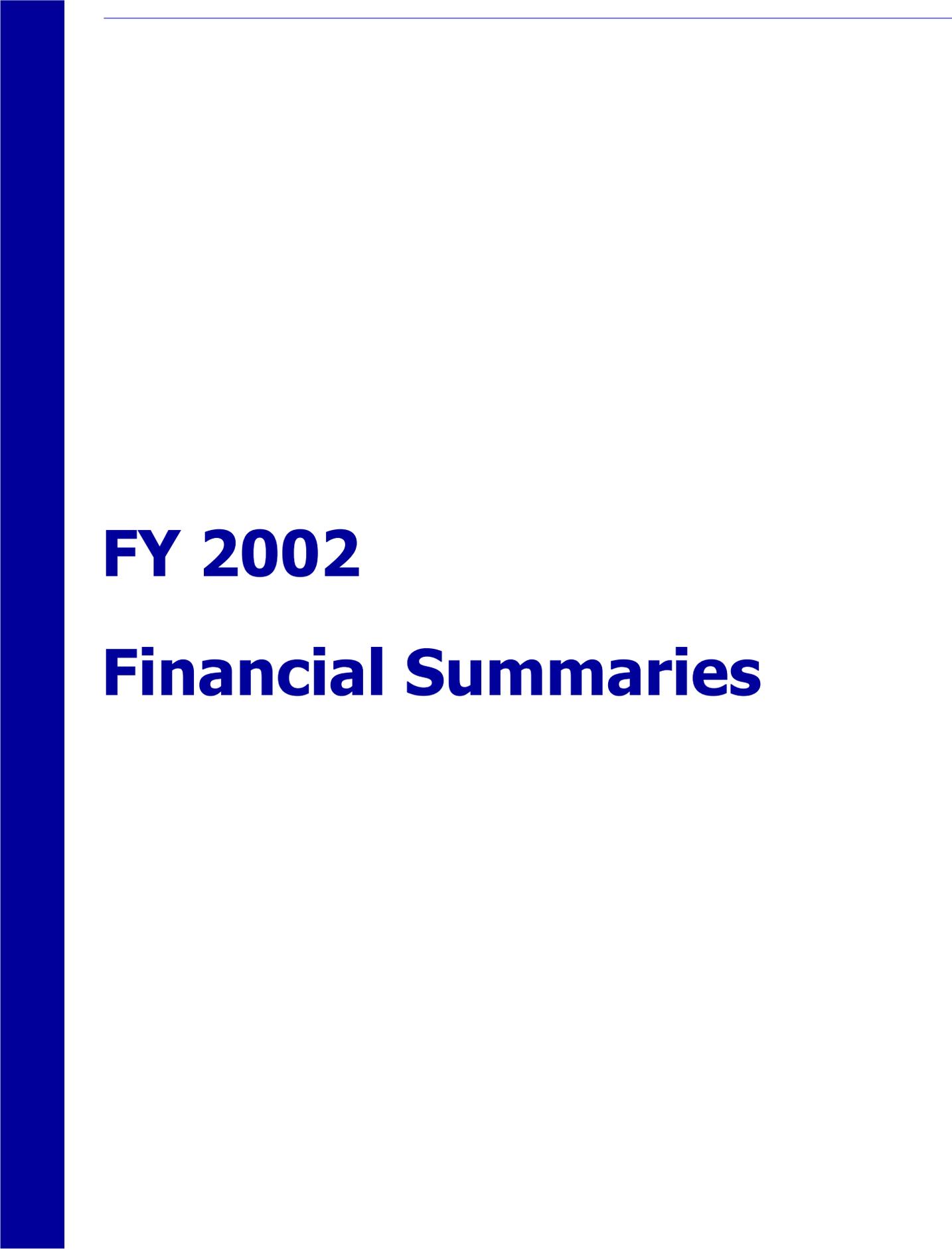
The Cyber Security Laboratory (CSL), which was established in FY 2001, was used to perform network vulnerability scanning of the BNL computer network in September 2001 (enumerating a total of 2,310 systems on 23 subnets with 644 of these having services open to the public internet), and the CH computer network in November 2001. The first upgrade of the CSL systems was completed in April 2002. Equipment was upgraded from three Pentium 200 systems running Red Hat Linux 6.2 and Windows NT 4.0 to four Pentium II 400 systems running Red Hat Linux 7.2 and Windows 2000. Upgrades were completed using excess equipment and included improved versions of both the open source and DOE licensed scanning tools. The upgraded systems were used to conduct follow-up scans of the BNL computer network (April 8-12, 2002) and scans of the ANL computer network (April 15-May 3, 2002) as part of a Cyber Security Review. These assessments revealed improved protection of both computer networks and the Review of ANL results in a rating of Satisfactory. The CSL continues to provide the capability to conduct scanning and vulnerability assessments of computer networks at low cost due to the use of excess computer equipment and the combination of open source and DOE licensed security tools. The CSL also provides the ability to evaluate new security tools, as well as direct experience and training in Windows and Linux system security, configuration, and administration.

Safety and Technical Services (STS)

FY 2002 was a busy year for STS. Numerous reviews were performed internally and included CH as well as M&O Contractors' performance. Examples of reviews in the Environmental, Safety and Health (ES&H) area included the MiniBooNE readiness review, the BNL fire protection program, the ANL Site maintenance plan, and the transportation compliance program reviews at ANL-East, ANL-West, and Ames Laboratories. In addition, National Environmental Policy Act (NEPA) compliance services and real property services were also conducted at CH facilities.

External reviews were also conducted at INEEL and the Idaho Operations Office that covered their Industrial Hygiene policies and procedures. Another review was conducted for SC that covered the Federal Employee Occupational Safety and Health (FEOSH) Program.

STS also developed operation policy and procedures for facility management that include CH Order 450.4A, *CH Program for Maintaining and Improving Integrated Safety Management (ISM) at CH Laboratory Sites*, and CH Order 414.1A, *Quality Assurance*.



FY 2002

Financial Summaries

Chicago Operations Office Balance Sheet

Assets	<u>9/30/02</u>	<u>9/30/01</u>
Fund Balance with Treasury	\$1,157,225,996	\$1,128,624,548
Intragovernmental Accounts Receivable, Net	13,465,744	15,345,965
Other Intragovernmental Assets	1,899,297	2,176,371
Governmental Accounts Receivable, Net	23,712,311	29,306,924
Inventory	395,592,622	382,952,338
General Property, Plant, and Equipment, Net	3,090,124,454	3,037,971,974
Other Governmental Assets	<u>10,654,148</u>	<u>11,403,194</u>
 Total Assets	 <u>\$4,692,674,572</u>	 <u>\$4,607,781,314</u>
 Liabilities		
Intragovernmental Accounts Payable	\$10,814,600	\$11,721,004
Intragovernmental Deferred Revenues	679,057	772,320
Other Intragovernmental Liabilities	4,435	2,565
Governmental Accounts Payable	400,380,731	475,250,668
Deferred Revenues	25,079,527	23,904,980
Environmental Liabilities	4,172,436,049	4,778,430,980
Pension and Other Actuarial Liabilities	779,225,743	727,736,103
Other Governmental Liabilities	<u>248,789,963</u>	<u>205,481,792</u>
 Total Liabilities	 <u>\$5,637,410,105</u>	 <u>\$6,223,300,412</u>
 Total Net Position	 (\$944,735,533)	 (\$1,615,519,098)

The Balance Sheet reflects assets of \$4.7 billion and liabilities of \$5.6 billion. Assets consist primarily of allotments (fund balances with Treasury), and general property, plant and equipment. Liabilities consist primarily of governmental accounts payable, environmental liabilities and pension, and other actuarial liabilities. Liabilities in excess of assets of \$945 million (Net Position) is primarily due to the recognition of the environmental liability.

Chicago Operations Office Significant Balance Sheet Items

General Property, Plant, and Equipment, Net	<u>9/30/02</u>	<u>9/30/01</u>
Completed Plant and Equipment	\$5,168,052,916	\$5,124,089,572
Accumulated Depreciation	(2,498,152,601)	(2,498,552,509)
Construction Work in Progress (CWIP)	<u>420,224,139</u>	<u>412,434,911</u>
Net Book Value	<u>\$3,090,124,454</u>	<u>\$3,037,971,974</u>

An increase of \$52 million in the net book value of general property, plant and equipment is primarily a result of:

- (1) A \$32 million increase at Fermi National Accelerator Laboratory due to the increase in Construction Work In Progress (CWIP). CWIP is continuing on the NUMI line-item plant project and numerous equipment projects including MINOS, CMS, and LHC;
- (2) The balance of the increase is due to assets being acquired for the MOX Fuel Fabrication Facility.

Liabilities

Accounts Payable	<u>\$400,380,731</u>	<u>\$475,250,668</u>
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A decrease of \$75 million in accounts payable is a result of the Departmental cost accrual policy for grant type awards. During FY 2001, accruals were recorded on a straight-line basis, based upon the length of the project period. In FY 2002, costs were recorded based upon accrual information received from the grantees.

Environmental Liabilities

Funded	\$5,680,535	\$13,924,431
Unfunded:		
Active Facilities	2,958,021,255	3,945,054,720
Environmental Management Facilities/Sites	<u>1,208,734,259</u>	<u>803,804,830</u>
Total	<u>\$4,172,436,049</u>	<u>\$4,762,783,981</u>

The \$987 million decrease to Active Facilities is primarily due to the changes in the Life Cycle Adjustments and Inflation Adjustments. The \$405 million increase to Environmental Management Facilities/Sites is primarily due to the change in the Life Cycle Cost Estimates.

Pension & Other Actuarial Liabilities

Contractor Post-Retirement Benefits Other than Pensions	\$779,176,486	\$727,622,879
Contractor, Retirement Plans (Pensions)	<u>49,257</u>	<u>113,224</u>
	<u>\$779,225,743</u>	<u>\$727,736,103</u>

The \$52 million increase in contractor post-retirement benefits other than pensions is a result of updated actuarial assumptions.

Chicago Operations Office Statement of Operations

Financing Sources	<u>9/30/02</u>	<u>9/30/01</u>
Allotments	\$2,127,159,742	\$2,086,795,824
Funds from Transfer of Contracts	7,035,718	334,986
Budget Authority from Other DOE Offices	<u>83,996,294</u>	<u>65,237,535</u>
 Total Financing Sources	 <u>\$2,218,191,754</u>	 <u>\$2,152,368,345</u>
 Expenses		
Program Expenses:		
Energy Resources	\$236,858,790	\$231,439,877
National Security	136,211,855	109,568,871
Environmental Quality	35,727,662	(4,677,818)
Science & Technology	1,401,713,734	1,370,320,372
Other Programs	<u>27,952,449</u>	<u>22,864,412</u>
 Total Program Costs	 <u>\$1,838,464,490</u>	 <u>\$1,729,515,714</u>

This Statement of Operations shows the amount of funding provided to CH and how much cost was incurred by program expenses in support of DOE missions. In addition to the program funding received from Headquarters, CH also received funding from other sponsors. Specifically, obligations were recorded as follows:

- (1) Headquarters program obligations increased by \$60 million (from \$1,964M to \$2,024M);
- (2) Reimbursable work for Non-Federal Entities increased by \$13 million (from \$28M to \$41M);
- (3) Reimbursable work for Other Federal Agencies increased by \$16 million (from \$86M to \$102M);
and
- (4) Technology Transfer activities increased by \$700 thousand (from \$4M to \$4.7M).

Costs on the accounting record are comprised of charges to many individual program accounts. The many programs are then summarized into one of the above five expense groups. National Security increased \$26 million due to the heightened security levels at all CH sites; Environmental Quality increase of \$41 million is a result of a significant decrease in cost for FY 2001; and Science and Technology increased by \$31 million due to additional costs for accelerator operations and research and technology at both Argonne National Laboratory and Fermi National Accelerator Laboratory.

Chicago Operations Office Significant Balance Sheet Items

Fund Balance with Treasury

Opening Balance October 1, 2001		\$1,128,624,548
Funds In		
Allotments from DOE HQ	\$2,127,159,742	
Funds from Transfer of Contracts-Other DOE Offices	7,035,718	
Budget Authority From Other DOE Offices	83,996,294	
Collections	<u>148,416,819</u>	
Total Funds In		<u>\$2,366,608,573</u>
 Total Funds Available		 \$3,495,233,121
Funds Out		
Disbursements	(\$2,147,112,023)	
Appropriated Reimbursements Returned to HQ	(145,243,349)	
Unobligated Allotments Returned to HQ	(19,333,199)	
Budget Authority to Other DOE Offices	(18,236,603)	
Deobligated Allotments Returned to HQ	(1,731,755)	
Transfer of Contracts to Other DOE Offices	<u>(6,350,196)</u>	
Total Funds Out		<u>(2,338,007,125)</u>
 Ending Balance September 30, 2002		 <u>\$1,157,225,996</u>

Paying for the Chicago Operations Office mission:

We disburse funds from our account at Treasury to pay for costs associated with DOE's missions. Fund balance with the Treasury (from the first line of our Balance Sheet) shows the case balance in our checking account. This account is increased primarily by allotments received from Headquarters (\$2,127 million) and reduced by disbursements (\$2,147 million). There are other funding activities that impact our ability to pay our debts. We also received funds from other DOE offices (\$84 million) and we transferred funds to other DOE offices (\$18 million). An additional \$7 million was received from other DOE offices by the transfer of contracts and grants to CH. Collections (\$148 million) are primarily offset by appropriation reimbursements that are returned to Headquarters (\$145 million). The ending balance indicates our checking account with Treasury increased by \$29 million.