

U.S. DEPARTMENT OF ENERGY
**PERFORMANCE AND
ACCOUNTABILITY REPORT**
FISCAL YEAR 2003

PERFORMANCE RESULTS

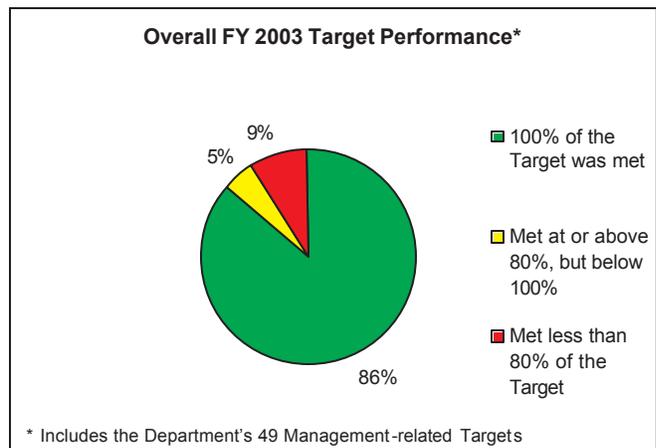
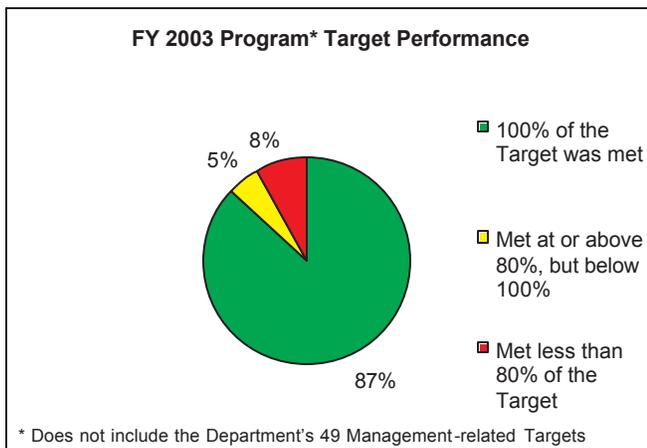
INTRODUCTION TO THE DETAILED PERFORMANCE RESULTS SECTION

In Fiscal Year 2003, the Department carried out its mission through the pursuit of **72** Program Goals (of which **eight** are general management-related goals) that articulate long-term outcomes (three to five years, or a longer period if appropriate for the program), and **252** Annual Targets (of which **49** are general management-related Targets) that represent short-term (one-year) outcomes and/or outputs. Interim progress made toward annual Targets is assessed by the performing organizations according to the completion of quarterly milestones.

The FY 2003 performance section of the report is composed of chapters for each General Goal, in order of the four Strategic Goals they support, and consist of five sections:

- General Goal Overview, including a summary of FY 2003 annual performance against our Annual Targets, and FY 2002 and FY 2003 Costs;
- Description of the Department’s Program Goals that support the General Goal, including a Commentary section;
- Description of our rating/assessment of the FY 2003 Annual Performance Targets associated with that Performance Goal;
- Description of our rating/assessment of the Related Annual Targets for the period FY 2000 – FY 2002;
- Description of our Plan of Action for any annual Targets that experienced performance shortfalls during the fiscal year.

Our performance through the course of FY 2003 against our Annual Targets is depicted in the following charts, using the color-coding scheme that is provided by our Joule performance tracking system (which is described below):



Joule Performance Monitoring and Tracking System

Joule is the Department of Energy’s performance measurement tracking system for program goals and annual targets included in the Department’s Annual Performance Plan (APP), replacing the Solomon system used prior to FY 2003. Program goals and annual targets are created and reported on by offices/administrations, with assistance from the Office of Management, Budget and Evaluation (OMBE).

Progress toward meeting program goals and annual targets is rated quarterly using the Joule system. A “green” rating indicates that 100 percent of the performance goal for a given quarter was met. A “yellow” rating indicates that less than 100 percent, but at least 80 percent, of the performance goal was met. A “red” rating indicates that less than 80 percent of the performance goal was met.

A Consolidated Quarterly Performance Report (CQPR) is created each quarter by OMBE, and transmitted to senior management by the Deputy Secretary of Energy. The report includes summaries of performance in several areas, including Joule/APP, Small Business Awards, Project Summary Assessments, and President’s Management Agenda initiatives.

The Joule component of the CQPR provides senior managers a “quick look” at program performance. The data is not meant to be a comprehensive assessment of program performance, but rather an “early warning” device that will alert managers to potential problems that may hinder the completion of annual performance commitments. Four sections make up the Joule component:

1. Joule Hierarchy – A graphic hierarchy shows how program goal performance rolls up to calculate the performance of each office.
2. Areas for Management Attention – This section includes narrative descriptions highlighting issues that may require senior management attention. For example, this area identifies red- and/or yellow-rated measures.
3. Noteworthy Accomplishments – This section includes narrative descriptions of noteworthy accomplishments. For example, this area may include descriptions of quarterly milestones that were exceeded due to exceptional performance.
4. Annual Target Performance – Along with those of program goals, performance ratings of annual targets are included.¹ Targets rated red or yellow are annotated. If available, plans for improving performance are included.

¹ Because of its large number of annual targets, the Office of Science’s Joule component only includes the ratings for the program goals. The performance hierarchy displays program goal groupings rolled up to the overall rating for the Office of Science. Detailed explanations of yellow/red targets are included, and are linked to the appropriate program goal.

Status of Fiscal Year 2003 Management Goals and Targets

The Department's Strategic and General Goals are accomplished throughout the fiscal year not only through the efforts of the major program offices in the Department, but with additional effort from staff offices that support the programs in carrying out the missions. The Department's staff offices perform critical functions necessary for successfully achieving the Department's programmatic goals and functions. These functions including managing information technology, ensuring sound legal advice and fiscal stewardship, developing and implementing uniform program policy and procedures, maintaining and supporting our workforce, safeguarding our work spaces, and providing Congressional and public liaison.

To accomplish these management objectives, the Department monitored its performance against **eight** Program Goals and **49** Annual Targets related to programs managed by the Office of the Chief Information Officer, the Office of Environment, Safety, and Health, the Office of Management, Budget, and Evaluation, the Office of Security, and the Office of Worker and Community Transition. With the exception of the seven Targets specified below, the Department's performance against its management-related Targets was rated at 100% or above.

FY 2003 Performance Deficiencies for Management-Related Annual Targets

Office	Target Number in Joule	Assessment	Explanation
CIO	CM2-1d	Met less than 80% of the Target	Improve and Maintain the Department's Secure Telecommunication Capability: All COMSEC and TEMPEST activities scheduled for FY 2003 are completed. Planned FY 2003 secure telephone replacements were delayed until FY 2004 and funding (\$5M) was redirected to fund Phase I of the Oracle enterprise license agreement. No decrease in secure communications resulted from this delayed deployment as existing secure telephones are still performing adequately.
CIO	CM2-1e	Met less than 80% of the Target	OCIO Staff Skill Sets: The Office of the CIO sent one senior information management specialist to the Federal Executive Institute's one-month Leadership program. The program was completed mid-October. With the completion of the executive leadership program, the OCIO organization is better positioned to support workforce planning initiatives in developing career executive skill sets to improve agency performance. The implementation plan to provide Individual

Office	Target Number in Joule	Assessment	Explanation
			<p>Development Plan training for the OCIO was delayed resulting from meetings with Union representatives to revise the strategies and solutions on the change in direction for training. A memorandum announcing the training was issued on September 22, 2003. The training schedule is being developed in coordination with the Training Office with a target completion date of October 31. The revised date for completion of training plans in response to 25% of common themes is the first quarter of FY 2004.</p> <p>Target not met. The implementation plan to provide IDP training for the OCIO has been initiated. The Training Office conducted the first OCIO training on IDP development on October 22 with remaining training sessions to be completed by October 31. This will accomplish meeting the target of training 100% of OCIO staff by October 31, 2003.</p> <p>The OCIO trained and "certified" 100% of IT Project Managers (as identified on Exhibit 300s for FY 2004) by the 4th quarter of FY 2003. This surpasses the original OCIO target of training 85% of IT will provide more secure and efficient operations.</p>
CIO	CM2-1f	Met less than 80% of the Target	<p>Centralization of IT Operations: The OCIO identified a central storage solution for the new Office of Legacy Management (LM), which has, as part of its mission, responsibility for establishment of a central repository of closure site records. In anticipation of transferring this responsibility to LM, the OCIO provided expert analysis of related issues, identification of alternatives with recommended solutions, cost/benefit analyses, and leadership in planning meetings with a planning team from LM and the Office of Environmental Management. OCIO continues to provide assistance as needed. A final decision on central storage rests with LM. Post OCIO identification of and planning for a central storage solution, responsibility transferred to LM at the end of the 3rd Quarter FY 2003 under reorganization. The OCIO fulfilled responsibility leading up to the point of transfer to LM.</p>

Office	Target Number in Joule	Assessment	Explanation
			In anticipation of the transfer of responsibility for establishment of a central repository of closure site records to the Office of Legacy Management in FY 2003, the OCIO identified a central storage solution that will provide more secure and efficient operations.
CIO	CM2-1h	Met at or above 80%, but below 100%, of the Target	<p>Strengthen Cyber Security Posture: Monthly vulnerability scanning of all HQ IT assets has led to a positive closure trend for closing SANS/FBI top 20 vulnerabilities (including those vulnerabilities designated as high by FedCIRC) within 24 hours. The final draft of the Program Cyber Security Plan has been completed and sent to LPSOs for review. Scheduled release date is October 18, 2003. One third of the program/staff offices completed self-assessments in accordance with NIST SP 800-26 at the end of the third quarter. The fourth quarter commitment was tied to the implementation milestone identified in the transmission memorandum for DOE O 205.1. IM-30 granted an extension of the original milestone of (September 18th) for thirty days, moving the milestone out to October 18. The HQ PCSP was officially signed out to Final on October 22. The corrective action has been taken to fulfill this fourth quarter target. Target has been met, but was not completed until after the end of FY 2003.</p> <p>With the implementation and maturity of the HQ vulnerability scanning program for both wired and wireless networks, DOE HQ has successfully benefited from the mitigation, decontamination and eradication of virus/worms. In June and July, 2003, the OCIO responded favorably to two OMB data calls that resulted in the 100% successful mitigation of all critical CISCO IOS and Microsoft DCOM vulnerabilities across the HQ infrastructure and network; ensuring the confidentiality, integrity and availability of key DOE HQ assets and capabilities.</p>
ME	CM1-2b	Met less than 80% of the Target	Identify Future Studies: Candidates for the Feasibility Study were approved by the Deputy Secretary on September 10, 2003. Over the past several months, Office of Management and Budget

Office	Target Number in Joule	Assessment	Explanation
			<p>(OMB) officials have publicly stated that OMB was revising the Administration's goals for achieving success in the Competitive Sourcing program. We were notified that agencies would be required to study all of their "available" (B coded) positions as identified in the 2003 FAIR Act Inventory instead of having to study 50 percent of our commercially coded positions. Conclusion of the Feasibility Studies is required to identify and announce the next round of DOE A-76 Studies. We provided the Deputy Secretary with a revised Feasibility Study plan on November 1, 2003.</p> <p>A Program Manager has been appointed, the methodology for conducting feasibility studies was developed, a support contractor was selected and a candidate listing of functions/organizations to be evaluated was developed. Consultation briefings were conducted within OMB/CFO to assist in candidate selection and OMB was briefed on the DOE process. The candidate listing was submitted to the Deputy Secretary who then approved the recommendations and authorized the start of the study.</p>
ME	CM1-4b	Met less than 80% of the Target	<p>Department Strategic Plan: The Strategic Plan was published on September 29, 2003. The Strategic Plan updates our mission, establishes long-term goals and our strategies to achieve them, and identified key intermediate objectives along the way. This Plan provides the basis for evaluating our performance. The DOE Strategic Plan is required in accordance with the Government Performance and Results Act (GPRA). Agencies are required to submit an updated and revised Strategic Plan to Congress and OMB within three years of submitting its previous Strategic Plan. DOE submitted its new Strategic Plan in September 2003 and has provided a timely and comprehensive update that charts the future course of the Department.</p> <p>Guidance for program plans will be issued in the first quarter of FY 2004. Although the guidance is late, it should not impact the actual accomplishment of the program plans.</p>

Office	Target Number in Joule	Assessment	Explanation
SO	CM5-1b	Met at or above 80%, but below 100%, of the Target	DOE Strategic Plan for Security: SO has developed a 25-year DOE Strategic Security Plan that details how we intend to counter the evolving threat with improved protection capabilities. This Plan was distributed to all Departmental Elements for review and concurrence by September 5, 2003. SO has resolved all official comments received and is still awaiting official concurrences from several Offices. SO will forward the Plan to the Deputy Secretary for signature if concurrences are not received in a timely fashion.

- CIO - Office of the Chief Information Officer**
- ME - Office of Management, Budget, and Evaluation**
- SO - Security**

Status of Fiscal Year 2002 Targets for Which Performance Was Below Expectations

Appendix A to the Detailed Performance Results section is a table that provides the current status of all FY 2002 that were rated/assessed as either “Mixed Results” or “Not Met.” In each case, a “Plan of Action” was included in the FY 2002 Performance and Accountability Report, to identify specific actions the Department would take in FY 2003 to ensure completion and/or closure of these items. The status of these actions (through the Fourth Quarter) is provided in the far right-hand column.

Goal 1: Nuclear Weapons Stewardship

Summary of FY 2003 Annual Performance

5	Targets Met	3	Targets Not Met
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FY 2002 Net Costs (in thousands):
Goal 1 Costs: \$4,864,000

FY 2003 Net Costs (in thousands):
Goal 1 Costs: \$5,214,000

Refer to Page 303 of the Financial Results section for a consolidated statement of net cost by Goal.

Annual Performance Goals and Targets FY 2000 – FY 2003 Results

General Goal One: Nuclear Weapons Stewardship: Ensure that our nuclear weapons continue to serve their essential deterrence role by maintaining and enhancing the safety, security, and reliability of the U.S. nuclear weapons stockpile.

Program Goal	Assessment
<p>NS1-1: Conduct a program of warhead evaluation, maintenance, refurbishment, and production, planned in partnership with the Department of Defense.</p> <p>Commentary – Successful accomplishment of the FY 2003 performance targets made a positive contribution toward achieving this long-term goal that, in turn, is essential to maintaining and enhancing the safety, security, and reliability of the Nation's nuclear weapons stockpile to counter the threats of the 21st century. Absent underground nuclear testing, the stockpile was enhanced and certified as safe, reliable, and secure and able to meet National Security requirements.</p>	<p>Met at or above 80%, but less than 100% of the Goal</p>

Annual Target for FY 2003	Assessment
<p>NS 1-1a Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapon stockpile.</p> <p>Commentary – The program activity was completed in the 2nd Quarter, as scheduled. The comprehensive science-based Stockpile Stewardship Program assessment (research & development, maintenance, refurbishments, and surveillance) supported the Secretarial (Defense and Energy) certification of the reliability and readiness of the nuclear weapon stockpile. This assessment-certification activity is critically important to the U.S. national security in the absence of underground nuclear weapon testing.</p>	<p>Met 100% of the Target</p>

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	The sixth annual letter to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapon stockpile was transmitted in July 2002.	MET GOAL
FY 2001	Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapon stockpile.	MET GOAL
FY 2000	Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapons stockpile.	MET GOAL

Annual Target for FY 2003		Assessment
NS 1-1b	Meet all annual weapons maintenance, refurbishment, and dismantlement schedules developed jointly by the DOE and DoD.	Met at or above 80%, but less than 100% of the Target
<p>Commentary and Plan of Action – These activities directly maintain the nuclear weapons stockpile in a state of readiness, reliability, and safety to support U.S. national security interests, including extending the life of the bombs and warheads. Specific activities were scheduled following DoD-NNSA coordination, based upon the needs of both. During FY 2003, the Directed Stockpile Work (DSW) efforts included continuation of approved alterations (Alts) on the B61, W78, B83, and W87 nuclear weapons. The W78 Alt 351, B83 Alt 355, and W87 Alt 345 were completed as scheduled. The B61 Alts will continue to the end of FY 2004 on a new schedule for kit delivery that has been agreed to by the Air Force. The majority of scheduled deliverables for the W76-1 and B61-7/11 Life Extension Programs (LEPs) were met. However, slight delays in several scheduled deliverables for both LEPs did occur; but, the delayed scheduled deliverables did not affect the milestones to support either of the first production units (FPUs). The B61-11 nondestructive evaluation effort met all scheduled milestones early. The planned dismantlement efforts proceeded as scheduled. The overall Yellow rating reflects the status of the W80 LEP that is being rebaselined to a Q4, FY 2007 FPU for the Advanced Cruise Missile, due to U.S. Air Force flight test support problems. Plan of Action: The NNSA and DoD will be presenting the rebaselined program to the Nuclear Weapons Council in early FY 2004 for approval of a revised W80 LEP schedule.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Meet all annual weapons maintenance, refurbishment, and dismantlement schedules developed jointly by the DOE and DoD. This includes meeting milestones in the FMFIA corrective action plan for the Significant Issue of Stockpile surveillance and testing. Result:	MET GOAL

	<p>Met all annual weapons maintenance, refurbishment, and dismantlement schedules developed jointly by the DOE and DoD. In addition, the final remaining FMFIA Stockpile Surveillance and Testing corrective action for FY 2002, development and implementation of a comprehensive Significant Finding Investigation (SFI) database, is closed. The Sandia National Laboratory-maintained SFI database was upgraded to make it comprehensive, and became operational in June 2002. A separate database is currently under development at NNSA/AL to track corrective actions taken and plans developed in response to SFIs. This database is scheduled to be operational on March 31, 2003.</p>	
FY 2001	<p>Meet all annual weapons maintenance and refurbishment schedules developed jointly by the DOE and DoD.</p>	MET GOAL
FY 2000	<p>Meet all annual weapons alteration and modification schedules developed jointly by DOE and DoD.</p> <p>Plan of Action: Six of the 11 modifications were behind schedule. Revised schedules have been negotiated with DoD that will meet their operational needs.</p>	BELOW EXPECTATIONS

Program Goal	Assessment
<p>NSI-2: Develop science, design, engineering, testing and manufacturing capabilities needed for long-term stewardship of the stockpile.</p>	<p>Met at or above 80%, but less than 100% of the Goal</p>
<p>Commentary – Successful accomplishment of the FY 2003 performance targets made a positive contribution toward achieving this long-term goal that, in turn, is essential to maintaining and enhancing the safety, security, and reliability of the Nation's nuclear weapons stockpile to counter the threats of the 21st century. Absent underground nuclear testing, the science-based stockpile continued to develop and field the necessary tools to maintain stockpile readiness. Furthermore, substantial progress is being made to revitalize and refocus the production capabilities of the nuclear weapon complex to meet the current needs of the stockpile and to develop an even more responsive infrastructure.</p>	

Annual Target for FY 2003	Assessment
<p>NS 1-2a Meet the critical FY 2003 Campaign performance targets contained in the NNSA Future-Year Nuclear Security Plan (FYNSP).</p>	<p>Met at or above 80%, but less than 100% of the Target</p>
<p>Commentary and Plan of Action – These 57 performance targets represented critical deliverables that directly support the long-term stewardship of the nuclear weapons stockpile. Of the 57, 51 are Green; 4 are Yellow, and 2 were cancelled. The 16 Campaigns are multi-year, multi-functional efforts involving, to varying degrees, every site in the nuclear weapons complex. They provide specialized scientific knowledge and technical support to the directed stockpile work on the nuclear weapons stockpile. The following campaigns successfully completed (Green) all of the indicated number of targets: Advanced Simulation and Computing (4); Pit Manufacturing and Certification (5); and four Engineering Campaigns (20). For the Inertial Confinement Fusion Ignition & High Yield Campaign, of 7 targets, 6 are green and 1 is yellow. Demonstrate filling of prototype NIF (National Ignition Facility) indirect drive ignition capsules and quantify key characteristics was incomplete because a key milestone, complete demonstration of cryogenic native beta-layered capsules at the Weapons Experimental Tritium Facility (WETF) 4Q was not done because, for safety reasons, WETF operations were suspended on 25 Jul. Plan of Action: The target has been tentatively rescheduled for FY 2004. An NNSA Operational Readiness Review is scheduled for 26 Jan 04; and resumption of WETF activities could occur 2-3 months later. For the four Science Campaigns, of 12 targets, 9 are Green and 3 are yellow: (1) Conduct major hydrotests at DARHT (Dual-Axis Radiographic Hydrotest Facility) and CFF (Contained Firing Facility) to support Life Extension Programs and Significant Findings Investigations was accomplished at LLNL, but delayed at LANL. Plan of Action: Deferred shots are scheduled for early FY 2004 and have LANL Director's commitment to complete. Also, LANL has constructed a beryllium containment system at DARHT, which will be demonstrated in early FY 2004. (2) Evaluate requirements for an advanced radiography facility was extended because anticipated new scientific results can provide more definitive mission need analyses. Plan of Action: Requirements are to be completed in FY 2004. After the requirements review, CD-0 will be rescheduled, if needed. (3) Measure neutron x-sections for unstable isotopes using Device for Advanced Neutron Capture Experiments has been deferred because of higher budget priorities at LANL. Plan of Action: Deferred to FY 2005 and will be tracked in the FY2003 and FY2004 PARs as required; but will not be a performance target. For the five Readiness Campaigns, 7 of 9 targets are green; one (Implement</p>	

Digital Radiography and Computerized Tomography for pit characterization) was cancelled when the related project (Materials Stewardship) was cancelled; and one (Finalize design criteria in support of the subprojects making up the Special Materials Capability Project) was cancelled when the Materials Campaign was cancelled as part of a realignment of responsibilities. Residual aspects of the Materials Campaign were transferred to the Materials, Containers, and Storage elements of Readiness in Technical Base and Facilities (RTBF).

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Perform a prototype calculation of a full weapon system with three-dimensional engineering features. Result: A prototype calculation of a full weapon system with three-dimensional engineering features was performed in FY 2002.	MET GOAL
FY 2001	Meet the F 2001 ASCI Program Plan milestones for development of modeling and simulation tools and capabilities required for design and certification of the nuclear weapons stockpile.	MET GOAL
FY 2000	Demonstrate a computer code capable of performing a three-dimensional analysis of the dynamic behavior of a nuclear weapon primary, including a prediction of the total explosive yield, on an Accelerated Strategic Computing Initiative (ASCI) computer system.	MET GOAL

Annual Target for FY 2003		Assessment
NS 1-2b	Implement the recommendations requested by the Nuclear Posture Review to refine test scenarios and evaluate the cost/benefit tradeoffs to sustain optimum test readiness that best supports the New Triad.	Met 100% of the Target
<p>Commentary – The program activity was completed in the 4th Quarter, as scheduled. The NNSA examined a list of test scenarios and used it as the basis for a 2002 Enhanced Test Readiness Cost Study, a report to the Nuclear Weapons Council, a 2003 Nuclear Test Readiness Report to Congress and continuing activities to support readiness to perform a broad range of tests, should the President so direct. An 18-month readiness posture was recommended as being reasonably optimal for most potential needs from a cost/benefit standpoint and the Nuclear Weapons Council concurred with that recommendation. Work to achieve 18-month readiness began in FY 2003 in accordance with the Test Readiness Program Plan.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002.	N/A
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000.	N/A

Program Goal	Assessment
<p>NS4-2: Provide state-of-the-art facilities and infrastructure supported by advanced scientific and technical tools to meet operational and mission requirements.</p> <p>Commentary – Successful accomplishment of the FY 2003 performance targets made a positive and on-schedule contribution toward achieving this long-term goal that, in turn, is essential to ensuring the vitality and readiness of the NNSA's nuclear security enterprise. Facility and infrastructure revitalization activities resulted in continued improvements to the condition of the nuclear weapons complex in support of Stockpile Stewardship Program requirements.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>NS 4-2a Meet established facility operating plans and construction schedules to ensure the physical infrastructure and facilities are operational, safe, secure, and compliant, and that a defined state of readiness is sustained at all needed facilities.</p> <p>Commentary - The program activity was completed in the 4th Quarter, as scheduled. These plans and schedules provide state-of-the-art facilities and infrastructure, supported by advanced technical tools to support the nuclear weapons complex. A safe, secure, compliant, and responsive operational infrastructure is provided at eight Nuclear Weapons Complex sites: three National Laboratories, four production sites, and the Nevada Test Site.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Meet established facility operating plans and construction schedules to ensure the physical infrastructure and facilities are operational, safe, secure, and compliant, and that a defined state of readiness is sustained at all needed facilities. This includes addressing safety issues to allow restart of the Y-12 enriched uranium reduction process. Result: Met all milestones for providing state-of-the-art advanced scientific and technical infrastructure.	MET GOAL
FY 2001	Ensure that the physical infrastructure and facilities are operational, safe, secure, and compliant, and that a defined state of readiness is sustained at all needed facilities	MET GOAL
FY 2000	Ensure that all facilities required for successful achievement of the Stockpile Stewardship Program remain operational. Plan of Action: Operations at LANL were severely impacted by the plutonium intake accident and the Cerro Grande fire at LANL.	BELOW EXPECTATIONS

Annual Target for FY 2003		Assessment
NS 4-2b	Execute a multi-year Recapitalization Program to arrest the deterioration and reduce the backlog of maintenance and repair projects.	Met 100% of the Target
<p>Commentary – Allocated approximately 69% of the Recapitalization budget to facilities and infrastructure specific deferred maintenance activities, thereby achieving significant reductions in gross deferred maintenance. The level of deferred maintenance is an indicator of the condition of the facilities and infrastructure across the nuclear weapons complex. The Recapitalization program funds capital renewal and sustainability projects with an emphasis on reducing deferred maintenance and restoring the condition of NNSA Sites’ facilities and infrastructure to an acceptable condition. (NOTE: The Facilities and Infrastructure Recapitalization Program (FIRP) FY 2003 Annual Target in the FY 2004 Congressional Budget stated: “Allocate 45% of the Recapitalization budget to facilities and infrastructure specific deferred maintenance activities, thereby achieving significant reductions in gross deferred maintenance.” This measure will be used to assess FIRP progress in FY 2003. Specific fiscal year targets for deferred maintenance (expressed as a dollar and percentage reduction from the baseline) will be reported beginning with the FY 2005 Congressional Budget submission.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Execute oversight of more than 50 FY 2002 Recapitalization Projects consistent with scope, cost, and schedule baselines. Result: As of September 30, 2002, the Facilities and Infrastructure Recapitalization Program (FIRP) executed oversight of 93 Recapitalization Projects consistent with approved scope, cost, and schedule baselines. Therefore, the performance target of “more than 50” Recapitalization projects has been met/exceeded. The FY 2002 performance target of 5000,000 square feet was significantly exceeded during FY 2003, with the completion of FY 2002-funded Disposition projects executed in FY 2003. All FY 2002 FIRP Disposition projects are complete.	MET GOAL
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000.	N/A

Program Goal	Assessment
NS4-3: Protect NNSA personnel, information and assets against attacks/espionage and respond to worldwide incidents involving nuclear or radiological weapons/materials.	Met at or above 80%, but less than 100% of the Target
Commentary – The successful implementation of Integrated Safeguards and Security Management in FY 2003, raised the security awareness focus for both federal and contractor staff throughout the weapons complex. The program remains on-track to improve the cost-effectiveness of protecting NNSA personnel, information, and assets.	

Annual Target for FY 2003	Assessment
NS 4-3a Assess line management’s progress in implementing Integrated Safeguards and Security Management.	Met 100% of the Target
Commentary – The 2002 ISSM Annual Report, including status through September 2003, rates ISSM as implemented at all NNSA field sites. This completes ISSM project tracking for the annual performance plan. It will not be continued in FY 2004.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Develop a strategic framework for responsive and effective security methodology following the September 11, 2001 events. Result: The Deputy Administrator for Facilities and Operations, in his Program Implementation Plan dated January 18, 2002, has made changes to the Safeguards and Security Program since September 11, 2001. The Department conducted Security Awareness refresher briefings and classified matter protection and control training; implemented the program with funds available; applied risk management techniques to allocate cyber security resources; conducted oversight reviews and assessments of Headquarters, Operations, and Site Offices; prioritized Iterative Site Analyses; and developed NNSA enterprise and site architecture and cyber security directives.	Met Goal
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000.	N/A

Annual Target for FY 2003		Assessment
NS 4-3b	Complete implementation of “Higher Fences” to enhance the protection of certain Restricted Weapons Data within the DOE and DoD.	Met less than 80% of the Target
<p>Commentary – The Higher Fences action has been terminated. Higher Fences was a joint, equal partnership endeavor with the DOD. The Atomic Energy Act authorizes the Secretary of Defense to maintain clearance equivalency with the DOE. The Higher Fences initiative was to require comparable access within both the DOD and DOE when accessing nuclear weapons. Due to higher costs within the Department of Defense to upgrade their clearances and polygraphs to meet comparable standards, the DOD non-concurred and severed the partnership goal of Higher Fences.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002.	N/A
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000.	N/A

Goal 2: Nuclear Non-Proliferation

Summary of FY 2003 Annual Performance

6

Targets Met

5

Targets Not Met

FY 2002 Net Costs (in thousands):

Goal 2 Costs: \$757,000

FY 2003 Net Costs (in thousands):

Goal 2 Costs: \$968,000

Refer to Page 303 of the Financial Results section for a consolidated statement of net cost by Goal

Annual Performance Goals and Targets FY 2000 – FY 2003 Results

General Goal Two : Nuclear Nonproliferation. Provide technical leadership to limit or prevent the spread of materials, technology, and expertise relating to weapons of mass destruction; advance the technologies to detect the proliferation of weapons of mass destruction worldwide; and eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons.

Program Goal	Assessment
NS2-1: Enhance the capability to detect Weapons of Mass Destruction (WMD), including nuclear, chemical, and biological systems, and terrorist threats.	Met 100% of the Goal
Commentary – During FY 2003, workscope and targets regarding enhancing capability to detect chemical and biological systems and nuclear smuggling were successfully transferred to the Department of Homeland Security. Beginning in FY 2004, a new goal and new targets will be used to measure the results to enhance capability to detect and monitor nuclear weapons proliferation which remains a DOE/NNSA mission.	

Annual Target for FY 2003	Assessment
NS 2-1a Demonstrate prototype commercial cargo inspection system to detect fissile materials and high explosives.	Met 100% of the Target
Commentary – On March 1, 2003, the NNSA mission, funding, and staff associated with achieving this performance target was transferred to the Department of Homeland Security (DHS). At the time of the transfer, NNSA efforts were on-schedule and within-cost to fully achieve this target. In addition, NA-22 has confirmed with the DHS project manager that DHS did successfully accomplish this target before the end of FY 2003.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Field a demonstrated, deployable prototype biological threat detection system at the Winter Olympics. Result: The Biological Aerosol Sentry and Information System (BASIS), the deployable prototype biological threat detection system, was successfully deployed in Salt Lake City during the Winter Olympics. All of the efforts were completed without incident. Information from the field operation center and laboratory was integrated into the public health infrastructure and served to provide compatible information for the decision making process.	MET GOAL
FY 2001	Demonstrate systems to protect key infrastructure and special events from chemical and biological attacks.	MET GOAL
FY 2000	Develop improved technologies and systems for early detection, and identification of and response to weapons of mass destruction proliferation and illicit materials trafficking.)	MET GOAL

Annual Target for FY 2003		Assessment
NS 2-1b	Provide two assays for biological threat agents to the Center for Disease Control Laboratory Response Network.	Met 100% of the Target
<p>Commentary – On March 1, 2003 the NNSA mission, funding, and staff associated with achieving this performance target were transferred to the Department of Homeland Security (DHS). At the time of the transfer, NNSA efforts were on-schedule and within-cost to fully achieve this target. In addition, NA-22 has confirmed with the DHS project manager that DHS did successfully accomplish this target before the end of FY 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
NS 2-1c	Demonstrate a fixed system to protect complex, key infrastructure facilities, components, and capabilities.	Met 100% of the Target
<p>Commentary – On March 1, 2003 the NNSA mission, funding, and staff associated with achieving this performance target were transferred to the Department of Homeland Security (DHS). At the time of the transfer, NNSA efforts were on-schedule and within-cost to fully achieve this target. In addition, NA-22 has confirmed with the DHS project manager that DHS did successfully accomplish this target before the end of FY 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
NS2-2: Prevent and reverse proliferation of Weapons of Mass Destruction (WMD).	Met at or above 80%, but less than 100% of the Goal
<p>Commentary – Significant progress has been made to prevent and reverse proliferation of WMD. This includes helping the U.S. Customs Service improve capabilities to detect and assess 25 suspect shipments, and assisting the IAEA and international partners improve physical protection through seven assessments. Retrieval of spent nuclear fuel from Central Asia has been delayed due to the need for the Russians to complete an Environmental Impact Statement before the fuel can be returned to Russia.</p>	

Annual Target for FY 2003	Assessment
NS 2-2a Expedite the retrieval of spent nuclear fuel from Central Asia.	Met at or above 80%, but less than 100% of the Target
<p>Commentary and Plan of Action – New Russian law requires an environmental impact statement before the fuel can be returned to Russia; this will be the first such transfer under the new law, making it difficult to estimate when return will be possible. Plan of Action: This is an ongoing issue that is outside the control of the United States. The program will provide status updates in the FY 2004 PAR.</p>	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
NS 2-2b	Work with U.S. Customs personnel to familiarize them with nuclear equipment, material, and technology, and to improve real-time analysis of suspect shipments.	Met 100% of the Target
<p>Commentary – Conducted three nuclear proliferation awareness seminars at the Federal Law Enforcement Training Center. Completed a Letter of Intent for cooperation on export control with the DHS Bureau of Immigration and Customs Enforcement. Reviewed 25 suspect shipments for WMD proliferation concerns. Initiated development of the WMD Identification of Product Information and Technology (WIPIT) Database.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Expand cooperation with other states and U.S. Customs to improve export control capabilities. Result: Launched an export control training program in the Caucasus, holding three workshops for Georgian, Azerbaijani, and Armenian officials. Participated in U.S. government-led export control programs involving Middle Eastern and Central Asian nations, including India, Taiwan, and Turkey. Introduced nuclear technology transfer controls under the DOE-China Peaceful Uses of Nuclear Technology agreement. Briefed U.S. Customs on DOE/NNSA capabilities suitable to support the export control enforcement mission.	MET GOAL
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
NS 2-2c	Expand bilateral physical protection visits, physical protection training, and the IAEA's International Physical Protection Advisory Service to help protect WMD facilities around the world against terrorist attack and sabotage.	Met 100% of the Target
<p>Commentary – Conducted physical protection visits and assessments in Japan, South Korea, Belgium, and Australia. Participated in IAEA International Physical Protection Advisory Service missions in Ukraine, Lithuania, and Armenia.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002.	N/A
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000.	N/A

Program Goal	Assessment
NS2-3: Protect or eliminate weapons and weapons-usable nuclear material or infrastructure and redirect excess foreign weapons expertise to civilian enterprises.	Met at or above 80%, but less than 100% of the Goal
<p>Commentary and Plan of Action– Significant progress has been made to protect and eliminate weapons, material and infrastructure and to redirect weapons scientists to civilian work, but some targets have been delayed. Achievements include starting down-blending of off-specification HEU at SRS 4 months early in February 2003, starting several project that will employ ~187 Russian scientists, and installing MPC&A upgrades on 22% of 600 MTs and 77% of Russian Navy warhead sites. Delays include meeting 98% and 85% of FY 2003 targets for Russian HEU converted under MCC and Russian border sites with nuclear detection equipment respectively. Also, Title II of the US MOX FFF has been intentionally delayed six months (to June 2004) to meet a Congressional requirement that U.S. and Russian plutonium disposition programs proceed in rough parallel. Liability issues should be resolved by April 2004 to allow the Russian to adopt the U.S. design for the Russian facility.</p>	

Annual Target for FY 2003	Assessment
NS 2-3a Complete Title II (detailed) design of the Mixed Oxide Fuel Fabrication Facility for disposition of excess U.S. weapons-grade plutonium, and commence down blending of off-specification highly enriched uranium at the Savannah River Site.	Met less than 80% of the Target
<p>Commentary and Plan of Action – MOX FFF: Due to Congressional mandate, the U.S. and Russian plutonium disposition programs must proceed in rough parallel. Although the U.S. program was on track to complete Title II design of the U.S. Mixed Oxide Fuel Fabrication Facility (MOX FFF) in December 2003, the schedule has been adjusted to ensure that the U.S. and Russian programs proceed in parallel. Plan of Action: Title II design of the U.S. MOX FFF is now scheduled to be completed in June 2004. The revised schedule allows a reasonable amount of time for resolution of liability issues, which have delayed the Russian schedule, and for the U.S. to adapt the design of the MOX FFF for use in Russia. The U.S. interagency hopes to resolve the liability issue by April 2004.</p> <p>HEU Down-blending: Down-blending of off-specification highly-enriched uranium at the Savannah River Site began in February 2003, four months ahead of the baseline schedule, and one month ahead of the early schedule.</p>	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Develop a plan for U.S. and Russian plutonium disposition that is politically, fiscally, and technically feasible, and obtain White House approval. Result: Following the Administration’s review in February 2002, the U.S. plutonium disposition program has been restructured focusing on the irradiation of Mixed Oxide (MOX) fuel in domestic reactors and eliminating immobilization. The Russian Federation has announced its intent to focus on the use of VVER-1,000 reactors (light water) as well as the possible export of plutonium for disposition outside of Russia. The Russians are also considering using the design of the U.S. MOX plant and will finalize their plans by the end of 2002.	MET GOAL

	The outstanding FY 2001 target regarding the shipment of the remaining 3MT (out of a goal of 9MT) of surplus U.S. highly enriched uranium to the USEC was partially completed with the shipment of 1.5MT in FY 2002. The remaining 1.5MT will be shipped during FY 2003.	
FY 2001	The siting decision for plutonium disposition facilities was implemented based on the Record of Decision in FY 2000.	Met Goal
FY 2000	Begin to implement a bi-lateral agreement with Russia for plutonium disposition.	Met Goal

Annual Target for FY 2003		Assessment
NS 2-3b	Install Material Protection Control and Accountability (MPC&A) upgrades on nuclear weapons and materials, eliminate weapons-usable materials, and consolidate the number of storage locations for weapons-usable materials into fewer building and sites to improve security in Russia.	Met at or above 80%, but less than 100% of the Target
Commentary and Plan of Action –		
Secured a cumulative total of 22% of the 600 MTs of weapons-usable nuclear material in Russia, and secured 77% of the Russian Navy warhead sites and secured a total of nine Radiological Dispersal Devices (RDD) sites (exceeding the target of eight) in regions of concern containing radiological materials. The security of these vulnerable weapons-usable materials and radiological materials prevents the theft and or diversion of these materials for illicit purposes such as nuclear terrorism including a radiological attack against the United States.		
Converted 16.1% (vs. 16.5%) of the 27 MTS of the HEU to LEU and installed radiation detection equipment at 39 (vs. 46) strategic and transit border sites in Russia. The security of vulnerable nuclear warheads and conversion of surplus HEU to LEU prevents the theft and diversion of these weapons and HEU for illicit purposes and prevents the proliferation of the materials, technology and expertise relating to weapons of mass destruction. The deployment of radiation detection equipment at strategic transit and border crossings and at air and sea transshipment hubs in Russian and other countries will provide these governments with the technical means to detect and interdict illicit trafficking in nuclear and radioactive materials. Plan of Action: In order to mitigate these shortfalls, NNSA plans to continue the pursuit of an MCC (Material, Consolidation and Conversion) agreement with the Russian Federation for the conversion of HEU to LEU, and by implementing agreements with Ukraine and Kazakhstan for the installation of radiation detection equipment at strategic areas.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Accelerate the rapid and comprehensive upgrades on at-risk plutonium, highly enriched uranium, and Naval nuclear weapons at Russian sites and Second Line of Defense deployments. Result: Completed comprehensive upgrades on an additional two percent of the 600MTs of weapons-usable nuclear material, raising the total to 17%. Completed comprehensive upgrades on an additional 22% of the estimated 4,000 Navy warheads, raising the total to almost 40%. Completed comprehensive upgrades at an additional three sites, raising	MET GOAL

	<p>the total to 41 of 95 sites completed. Converted an additional 0.8MT of highly enriched uranium to low enriched uranium, increasing the total amount converted to 3.2MT of weapons-grade nuclear material by converting it to non-weapons-grade. Installed radiation detection equipment at 15 strategic transit and border sites, raising the total to 23 sites. The outstanding FY 2001 target for completing comprehensive upgrades on the remaining one percent (of the original goal of eight percent) of 850 MT was fulfilled in FY 2002.</p>	
FY 2001	<p>(1) Target: Complete comprehensive upgrades on an additional eight percent of 850 metric tons (MTs) of weapons-usable nuclear material raising the total to almost 21% secured at 95 sites in Russia.</p> <p>Result: Completed comprehensive upgrades on an additional 7 percent of 850 metric tons of weapons-usable nuclear material, raising the secured total to almost 18 percent at 95 sites in Russia.</p> <p>Plan of Action: During FY 2001, DOE held protracted negotiations with MINATOM on an agreement necessary to gain access to sensitive Russian facilities for NNSA project oversight teams. The protracted negotiations, and the resulting lack of an agreement, prevented U.S. access to Russian facilities and prevented U.S. assurance that material protection, control and accounting work at Russian Institutes and facilities was completed. It also prevented U.S. access to facilities needed to complete contracts to initiate new work. The access agreement was reached and finalized in September 2001, and access to facilities began in October 2001. Presently, new contracts have been signed with Russian facilities and accelerated work schedules agreed to by DOE and MINATOM officials.</p>	NEARLY MET GOAL
	<p>(2) Complete comprehensive upgrades at an additional eight of 95 sites, raising the total to 37 sites.</p>	MET GOAL
FY 2000	Continued to install Materials Protection, Control and Accounting (MPC&A) upgrades in Russia, for defense-related sites, civilian sites, Russian Navy projects, and the transportation sector.	MET GOAL

Annual Target for FY 2003		Assessment
NS 2-3c	Enhance nonproliferation efforts in the Russian nuclear cities, and accelerate several Russian technology development efforts that have clear counter-terrorism or terrorism response applications under the Russian Transition Initiatives.	Met 100% of the Target
<p>Commentary – Completed closure of the Avangard nuclear weapons assembly plant, trained a cadre of nonproliferation specialists to teach nonproliferation courses at area universities through Monterey Institute, developed the Nonproliferation Centers at Sarov and Snezhinsk to consult on nonproliferation studies, drew additional 25 engineers from VNIITF to civilian work and staff at Spektr-Conversiya from 65 to 85 fulltime staff, approved two new projects that will engage 42 additional weapons scientists from VNIITF, and started the Positron Emission Tomography project, which will convert an additional 120 nuclear imaging specialists from VNIITF from weapons work to Medical technology. In addition, a new Russian-developed counter-terrorism technology to filter bio-agents from water supplies was transferred to a U.S. company and is now on the market as a commercialized product.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Engage 2,500 former WMD scientists on cooperative commercial projects.	Met Goal
FY 2001	Engage approximately 2,000 scientists, engineers, and technicians at nuclear NIS institutes and approximately 800 scientists, engineers and technicians at NIS chemical/biological institutes in 40 projects to provide long-term commercial employment.	Met Goal
FY 2000	Engage approximately 2,000 scientists, engineers, and technicians at nuclear NIS institutes and approximately 800 scientists, engineers and technicians at NIS chemical/biological institutes in 50 projects to provide long-term commercial employment.	Met Goal

Program Goal	Assessment
NS2-4: Reduce the risk of accidents in nuclear fuel cycle facilities worldwide.	Met at or above 80%, but less than 100%, of the Goal
Commentary – Significant progress has been made to complete risk reduction projects, including completing the Soviet-designed reactor safety program. Completion was scheduled for FY 2003, but a few activities have been delayed until FY 2004. All activities will be completed in FY 2004 within available FY 2003 funding.	

Annual Target for FY 2003		Assessment
NS 2-4a	Successfully complete and close down the Soviet-designed reactor safety program.	Met at or above 80%, but less than 100%, of the Target
Commentary and Plan of Action – The Soviet-designed reactor safety program received its last funding in FY 2003. Most projects are finished. Plan of Action: A few projects activities will be completed in FY 2004 within available funding.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002.	N/A
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000.	N/A

Annual Target for FY 2003		Assessment
NS 2-4b	Evaluate and prioritize nuclear safety concerns at nuclear power plants, research reactors and non-reactor nuclear fuel cycle facilities, and prepare needs assessments for technology transfers of nuclear safety methods based on risk with potential participant countries.	Met at or above 80%, but less than 100%, of the Target
<p>Commentary – Congress has terminated this program and is not providing any funding starting in FY 2004. Therefore, this performance measure is complete. The evaluation and prioritization of concerns at nuclear power plants and research reactors have been completed. Activities planned for 'other non-reactor fuel cycle facilities' were postponed during FY 2003 due to very limited funding, and finally stopped when the program learned that the entire worldwide safety program would be curtailed at the end of FY 2003. Therefore, no further evaluation or prioritization of concerns at non-reactor fuel cycle facilities or other needs assessments were performed. In light of the termination of the world-wide safety program by Congress in FY 2003, there are no FY 2004 follow-on activities necessary or Plan of Action, as the action is complete.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Develop a small nuclear safety pilot program between the U.S. Department of Energy and the Vietnamese Atomic Energy Commission.	Met Goal
FY 2001	(1) Complete safety parameter display systems for Ukraine's South Ukraine nuclear plant unit 3, and Zaporizhzhya nuclear plant units 2 and 4.	MET GOAL
	(2) Complete implementation of symptom-based emergency operating instructions at the Ignalina plant in Lithuania.	MET GOAL
FY 2000	Complete a full-scope simulator for Kola Unit 4 and Balakovo Unit 4 in Russia, and for South Ukraine Unit 3 in Ukraine.	MET GOAL

Goal 3: Naval Reactors

Summary of FY 2003 Annual Performance

6

Targets Met

0

Targets Not Met

FY 2002 Net Costs (in thousands):

Goal 3 Costs: \$657,000

FY 2003 Net Costs (in thousands):

Goal 3 Costs: \$665,000

Refer to Page 303 of the Financial Results section for a consolidated statement of net cost by Goal

Annual Performance Goals and Targets FY 2000 – FY 2003 Results

General Goal Three: Naval Reactors. Provide the Navy with safe, militarily effective nuclear propulsion plants and ensure their continued safe and reliable operation

Program Goal	Assessment
<p>NS3-1: Provide the Navy with safe, militarily effective nuclear propulsion plants and ensure their continued safe and reliable operations.</p> <p>Commentary – Provide the Navy with safe, militarily effective nuclear propulsion plants and ensure their continued safe and reliable operation. Naval Reactors (NR) is responsible for all Naval nuclear propulsion work, beginning with technology development and continuing through reactor operation and, ultimately, reactor plant disposal. The program ensures the safe operation of the many reactor plants in operating nuclear powered submarines and aircraft carriers (constituting 40% of the Navy's combat fleet), and fulfills the Navy's requirements for new nuclear reactor propulsion plants that meet current and future national defense requirements. For FY 2003, Naval Reactors successfully managed this "cradle-to-grave" responsibility for Fleet nuclear applications.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>NS 3-1a Complete safe streaming of approximately two million miles in nuclear-powered ships.</p> <p>Commentary – In FY 2003, nuclear-powered ships steamed over 2 million miles, surpassing 128 million miles of safe operation. Naval Reactors has ensured the safety, performance, reliability, and service-life of operating reactors for uninterrupted Fleet operations in support of national security requirements. Navy warships are deployed around the world every hour of every day to provide a credible “forward presence”, ready to respond on-the-scene wherever America’s interests are threatened. Nuclear propulsion plays an essential role in this, providing the mobility, flexibility, and endurance that today’s smaller Navy requires to meet a growing number of missions. Naval Reactors ensures this role by providing militarily effective nuclear propulsion plants and ensuring their safe, reliable, and long-lived operation.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain utilization factors of at least 90% for operation of test reactor plants, and 124 million miles cumulative steamed for nuclear-powered ships. Result: Nuclear-powered ships steamed over two million miles in FY 2002, surpassing the cumulative target of 124 million miles of safe operation. In addition, NR exceeded 90% utilization for operation of test reactor plants.	MET GOAL
FY 2001	Ensure the safety, performance, reliability, and service life of operating reactors for uninterrupted support of fleet demands, including maintaining utilization factors of at least 90% for test reactor plants, and 121 million miles steamed for nuclear-powered ships.)	MET GOAL
FY 2000	Ensure the safety, performance reliability, and service life of operating reactors.	MET GOAL

Annual Target for FY 2003		Assessment
NS 3-1b	Achieve a utilization factor of at least 90 percent for operation of test reactor plants.	Met 100% of the Target
<p>Commentary - Naval Reactors has two operating land-based prototype Naval nuclear propulsion plants at the Kesselring site in New York, and also is the principal customer of the Advanced Test Reactor (ATR) located at the Idaho National Laboratory. The prototype plants are an essential component in meeting Naval Reactors' mission of ensuring the safe and reliable operation of Naval reactor plants. Prototypes provide platforms for testing under actual operating conditions, which cannot be duplicated in the laboratory. For FY 2003, Naval Reactors maintained a utilization factor of 93.2 percent for the operation of these test reactor plants.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain utilization factors of at least 90% for operation of test reactor plants, and 124 million miles cumulative steamed for nuclear-powered ships. Result: Nuclear-powered ships steamed over two million miles in FY 2002, surpassing the cumulative target of 124 million miles of safe operation. In addition, NR exceeded 90% utilization for operation of test reactor plants.	MET GOAL
FY 2001	Ensure the safety, performance, reliability, and service life of operating reactors for uninterrupted support of fleet demands, including maintaining utilization factors of at least 90% for test reactor plants, and 121 million miles steamed for nuclear-powered ships.	MET GOAL
FY 2000	Ensure the safety, performance reliability, and service life of operating reactors.	MET GOAL

Annual Target for FY 2003		Assessment
NS 3-1c	Next-generation submarine reactor design 99 percent complete.	Met 100% of the Target
<p>Commentary – Naval Reactors has completed 99 percent of the design work on the VIRGINIA-class submarine reactor design. This new reactor design has a simpler, more compact propulsion plan with increased energy and a life-of-ship capability. This design eliminates the need for refueling over the expected 30-year life span of the ship, which will significantly reduce life-cycle costs. NR has completed efforts associated with initial core fill, post core cold and post core hot operations testing. At present, the Reactor Test Program is 80 percent complete. Float-off and christening occurred in August of 2003 and initial criticality is scheduled for the first quarter of FY 2004.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Develop new technologies, methods, and materials to support reactor plant design, including the next generation submarine reactor, which will be 96% complete by the end of FY 2002; and conduct detailed design efforts on a reactor plant for the next generation aircraft carrier. Result: NR developed new reactor plant technologies, methods, and materials to support reactor plant design. For example, NR completed qualification testing for the redesigned NIMITZ-class main coolant pump lead-unit. NR evaluated physics data from (late-in-life operation of) the S8G prototype core. These data are being used to improve performance of existing cores and optimize new core designs. NR employed multiple irradiation capsule experiments to increase irradiation capacity and enable further advanced fuel testing. This testing is key to developing and qualifying materials for longer lifetimes. The next generation submarine reactor development is 96% finished. NR met all nuclear propulsion plant milestones as detailed in the VIRGINIA Integrated Master Plan. NR completed the pre-core phase of the reactor plant test program and loaded the power unit into VIRGINIA, as planned. NR completed vendor development work on all reactor plant components. Design efforts continue on the reactor plant for the next-generation aircraft carrier, which is over 40% complete and on schedule to meet the planned ship construction start. NR has developed and applied detailed structural and thermo-hydraulic analytic models to the CVNX (A1B) steam generator design to finalize the structural internals of the units. NR completed the design of the core fueled region. (Reactor design work is now focused on maximizing the power capability the core can deliver through hydraulic pattern optimization.) NR completed the second phase of fuel and poison manufacturing development and initiated fuel element pre-production. NR remained on schedule for qualification testing of reactor component designs, with nearly 50% of the tests completed or in progress. Plant arrangements are progressing on schedule with concept arrangements completed for 33% of the design zones. NR met all nuclear propulsion plant milestones as detailed in the CVNX Integrated Master Plan.</p>	MET GOAL
FY 2001	Develop new technologies, methods and materials to support reactor	MET GOAL

FY 2000	plant design, including the next generation submarine reactor, which will be 93% complete by the end of FY 2001; and initiate detailed design efforts on a reactor plant for the next generation aircraft carrier. Develop new reactor plants, including the next generation reactor, the design of which will be 90% complete by the end of FY 2000; and complete initial development efforts on a reactor plant for the next generation aircraft carrier.	MET GOAL
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Annual Target for FY 2003		Assessment
NS 3-1d	Next-generation aircraft carrier reactor design 55 percent complete.	Met 100% of the Target
<p>Commentary – The next-generation aircraft carrier reactor plant design is 55 percent complete. The new high energy reactor design for CVN 21 represents a critical leap in capability; not only will CVN 21 enable the Navy to meet current forecasted operational requirements, but just as importantly, it will provide flexibility to deal with unanticipated war-fighting needs in the future. The CVN 21 reactor will provide 25 percent more energy than the reactors in NIMITZ-class ships, yet will require just half the number of sailors to operate and will be easier to maintain. Naval Reactors has completed design efforts necessary to support FY 2004 production contracts for all CVN 21 reactor plant heavy equipment, finalized the reactor compartment arrangement, and has initiated life testing of the reactor control rod drive mechanisms.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Related FY 2002, 2001, and 2000 Targets are included in the “Related Annual Target” narratives for FY 2003 Target NS 3-1c.	N/A
FY 2001	Related FY 2002, 2001, and 2000 Targets are included in the “Related Annual Target” narratives for FY 2003 Target NS 3-1c.	N/A
FY 2000	Related FY 2002, 2001, and 2000 Targets are included in the “Related Annual Target” narratives for FY 2003 Target NS 3-1c.	N/A

Annual Target for FY 2003		Assessment
NS 3-1e	No personnel exceed 5 rem/year.	Met 100% of the Target
<p>Commentary – Naval Reactors has an aggressive program to minimize personnel exposure to as low as reasonably achievable such that, since 1980, no Program personnel have received more than two rem in any one year. For FY 2003, the Program conducted radiological control, environmental and safety operations necessary to protect laboratory employees. The Program also minimized the release of hazardous effluents to the environment, and complied with all applicable regulations to ensure that no personnel exceeded Federal limitations for radiation exposure, as shown in the following:</p> <p>(1) Report NT-03-2, <i>Occupational Radiation Exposure from U.S. Naval Nuclear Plants and their Support Facilities</i>, dated March 2003; and (2) Report NT-03-3, <i>Occupational Radiation Exposure from Naval Reactors’ Department of Energy Facilities</i>, dated March 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain outstanding environmental performance by ensuring that no personnel exceed Federal limits for radiation exposure, and no significant findings result from environmental inspections by State and Federal regulators. Result: Naval Reactors maintained outstanding environmental performance by ensuring that no personnel exceeded Federal limits for radiation exposure, and operations had no adverse impact on human health or the quality of the environment.	MET GOAL
FY 2001	Maintain outstanding environmental performance by ensuring that no personnel exceed Federal limits for radiation exposure, and no significant findings result from environmental inspections by State and Federal regulators.	MET GOAL
FY 2000	Ensure that radiation exposures to workers or the public from Naval Reactors activities is within Federal limits, and no significant findings result from environmental inspections by State and Federal regulators.	MET GOAL

Annual Target for FY 2003		Assessment
NS 3-1f	Operations have no adverse impact on human health or the quality of the environment.	Met 100% of the Target
<p>Commentary - Naval Reactors cleans up after itself in a rigorous, environmentally safe, and correct manner—including properly maintaining our facilities. The Program has established environmental compliance programs to meet all applicable regulations directed toward environmental excellence. This includes areas such as remediation of historical facilities, emphasis on recycling and waste minimization, strict standards for air and water emissions and monitoring programs to validate that Program activities have no adverse effect on the environment. When properly and diligently dealt with, nuclear propulsion is a safe, efficient power source, and is environmentally less damaging than other sources. Naval Reactors continues to have an outstanding environmental performance record, despite today’s stricter government regulations, as shown in the following: (1) Report NT-03-1, Environmental Monitoring and Disposal of Radioactive Wastes from U.S. Naval Nuclear-Powered Ships and their Support Facilities, dated March 2003 and (2) Report NT-03-4, <i>Occupational Safety, Health, and Occupational Medicine Report</i>, dated March 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Related FY 2002, 2001, and 2000 Targets are included in the “Related Annual Target” narratives for FY 2003 Target NS 3-1e.	N/A
FY 2001	Related FY 2002, 2001, and 2000 Targets are included in the “Related Annual Target” narratives for FY 2003 Target NS 3-1e.	N/A
FY 2000	Related FY 2002, 2001, and 2000 Targets are included in the “Related Annual Target” narratives for FY 2003 Target NS 3-1e.	N/A

Goal 4: Energy Security

Summary of FY 2003 Annual Performance

90

Targets
Met

8

Targets
Not Met

FY 2002 Net Costs (in thousands):

Goal 4 Costs: \$2,041,000

FY 2003 Net Costs (in thousands):

Goal 4 Costs: \$1,609,000

Refer to Page 303 of the Financial Results section for a consolidated statement of net cost by Goal

Annual Performance Goals and Targets FY 2000 – FY 2003 Results

General Goal Four: Energy Security: Improve energy security by developing technologies that foster a diverse supply of reliable, affordable and environmentally sound energy by providing for reliable delivery of energy, guarding against energy emergencies, exploring advanced technologies that make a fundamental change in our mix of energy options, and improving energy efficiency.

Program Goal	Assessment
<p>ER1-1: (1) By 2005, FEMP activities will support Federal agency efforts to decrease energy intensity in standard Federal facilities by 30 percent and, by 2010, 35 percent, relative to the 1985 statutory baseline levels of 139,143 Btus per gross square foot; (2) by 2005, the costs to the DOE for energy and utilities will decline by 10 percent or \$30 million annually at expected purchased energy prices; (3) Departmental Energy Management Program Team activities will decrease the energy consumption intensity in DOE facilities by 45 percent by 2005, relative to the 1985 baseline levels of 441,776 Btus per square foot.</p> <p>Commentary – The most recent data available is for 2002. In 2002, energy use in the federal sector declined by 25 percent and energy costs were reduced by 31 percent compare to the base year 1985. The program goal is to be achieved by combining all the activities in FEMP which include Energy Savings Performance Contracts, training federal employees, energy assessments and energy savings projects at the Department's own facilities.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>ER1-1a Provide technical and design assistance for more than 40 energy efficiency, renewable energy, and water conservation projects; 10 will be large-scale distributed energy resources and combined heat and power projects. Report results achieved through the end of FY 2002.</p> <p>Commentary – The FY 2003 technical and design assistance goal of more than 40 projects was exceeded, whereby assistance was provided to 56 projects, mostly to DoD, GSA, DOE, and NPS. These projects include 10 large scale distributed energy resources and combined heat and power projects. These projects were evenly distributed throughout the six regions.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Provide technical and design assistance for more than 40 energy efficiency, renewable energy, and water conservation projects; 10 will be large-scale distributed energy resources and combined heat and power projects.	MET GOAL
FY 2001	There were no related Targets for FY 2001	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-1b	Achieve between \$80 and \$120 million in private sector Energy Savings Performance Contract (ESPC) investment.	Met 100% of the Target
<p>Commentary – Achieved \$254 Million in ESPCs in FY 2003, which is greater than twice the annual targeted amount, and a record breaking amount (previous high was \$121 Million in FY 2001). At least in part, this high level of activity was due to a sunset provision which disallowed agencies from entering new contracts after October 1, 2003. Most of the investments were for the typical energy savings projects, but two of the projects were for renewables: a biomass project for the U.S. Air Force and a geothermal project for the U.S. Navy.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Achieve between \$80 and \$120 million in private sector Energy Savings Performance Contract (ESPC) investment.	MET GOAL
FY 2001	Achieved \$120 million in private sector investment through Super ESPCs.	MET GOAL
FY 2000	Completed one nationwide Solar technology Super-Energy Savings Performance Contract (Super ESPC) for use by all agencies, bringing the total number of technology Super-ESPCs to four.	NEARLY MET GOAL
<p>Plan of Action: Issue the solicitation in FY 2001 and implement projects in calendar year 2001.</p>		

Annual Target for FY 2003		Assessment
ER1-1c	Complete at least 35 energy assessments including SAVEnergy Audits, industrial facility assessments and operation and maintenance assessments to identify energy and cost saving opportunities.	Met 100% of the Target
<p>Commentary – There were 56 energy assessments awarded in FY 2003, with the majority of the projects at DoD, USPS, GSA, NPS, and the FAA. Regions with the largest number of awards were Central, Midwest and Southeast. Facility sizes ranged from 20,000 square feet to over 2,000,000 square feet.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Complete at least 60 energy assessments including SAVEnergy Audits, industrial facility assessments and operation and maintenance assessments to identify energy and cost saving opportunities.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-1d	Integrate information on standby power into Defense Logistics Agency and General Services Administration's product schedules in accordance with E.O. 13221.	Met 100% of the Target
<p>Commentary – FEMP provided data on standby power products from our standby power data center to the data centers of the Defense Logistics Agency and General Services Administration in each quarter of FY 2003. GSA and DLA use this information to properly code standby power devices that meet FEMP's recommended levels into their schedules and online ordering systems.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Publishing initial listing of products that use minimal standby power by December 31, 2001, in accordance with E.O. 13221.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-1e	Train 4,000 Federal energy personnel in best practices supporting National Energy Policy education goals.	Met 100% of the Target
<p>Commentary – Exceeded target of 4,000 by training 6,270 federal employees in workshops at all six of EERE's Regional Offices for the year (over 1,600 in the fourth quarter of FY 2003). Workshops were held for Super ESPC's, UESC's, Renewable Energy, Design Strategies for Buildings, Operations and Maintenance, Water Resource Management, and Laboratory Design. FEMP conducted over 30 workshops including one web-based course and three tele-courses.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Train 4,000 Federal energy personnel in best practices supporting National Energy Policy education goals.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-1f	Complete the selection process for between four and twelve energy projects that will reduce the annual energy use in DOE facilities by 15 billion Btu's.	Met 100% of the Target
<p>Commentary – The Departmental Energy Management Program (DEMP) uses direct funding for retrofit projects and support for comprehensive adoption of model programs or "best practices" as the two major mechanisms for reducing energy consumption in DOE facilities. In FY 2003, DEMP completed project funding in the 4th quarter, funding 14 energy retrofit projects. These projects are anticipated to save approximately 15 billion Btus.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Continue efforts to reduce energy intensity in Federal buildings by 24% by the end of FY 2002 as compared to 1985 energy use. Result: Continued FEMP efforts have resulted in reductions of energy intensity in Federal buildings of 23.6% compared to the Executive Order baseline, reducing energy use per square foot from nearly 140,000 Btu to nearly 105,000 in FY 2001. (FEMP's efforts typically account for approximately 50% of annual energy saved.)	MET GOAL
FY 2001	Continued efforts to reduce energy intensity in Federal buildings and reported the results achieved through the end of FY 1999, toward the goal of achieving a 22% reduction by the end of FY 2001 as compared to 1985 energy intensity. Preliminary data suggests that agencies exceeded this goal a year early, achieving a 23.6% reduction in energy intensity in 2000.	EXCEEDED GOAL
FY 2000	Continued efforts to reduce the use of energy in Federal buildings and reported the results achieved through the end of FY 1998, towards the goal of achieving a 20% reduction by the end of FY 2000 as compared to 1985 energy use. Preliminary data shows that the Federal government reduced energy intensity by 17% in 1997.	MET GOAL

Program Goal	Assessment
<p>ERI-2: Between 1991 and 2010, contribute to a 25 percent decrease in energy intensity (as compared to 1991) by the energy-intensive industries of the future (a potential savings of 4.5 quads).</p>	<p>Met 100% of the Goal</p>
<p>Commentary – DOE’s long-term goal is to contribute to a decrease in the energy intensity of energy-intensive industries, and the activities conducted during FY 2003 supported that goal. Five new industrial energy efficiency technologies were commercialized, 6200 energy-intensive U.S. plants are applying EERE technologies and services to save energy, 23 energy-efficiency training sessions were held, and 20 Allied Partnership agreements were negotiated.</p>	

Annual Target for FY 2003	Assessment
<p>ER1-2a Commercialize four new energy efficient technologies in partnership with the most energy intensive industries.</p>	<p>Met 100% of the Target</p>
<p>Commentary – ITP commercialized two technologies in the first quarter of 2003, and one technology each in the second, third, and fourth quarters of 2003. These technologies are:</p> <ol style="list-style-type: none"> 1. Detection and Control of Deposition on Pendant Tubes in Kraft Chemical Recovery Boilers; 2. Catalytic Combustion; 3. Forced Internal Re-circulation Burner; 4. High-Intensity Silicon Vertical Multi-Junction Solar Cells; and 5. Long Wavelength Catalytic Infrared Drying System. 	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
<p>FY 2002</p>	<p>Target: Commercialize ten new energy efficient technologies in partnership with the most energy intensive industries. Result: From 1992-2001, 105 technologies were commercialized. For 2002, a total of ten technologies were commercialized. A decade of experience demonstrates that sufficient technologies will be identified in this year’s totals from the final report to exceed the target. The program project activities are consistent with the historic conversion of ten or more technologies being commercialized by industry. These data are collected at the end of the year through an annual survey.</p> <p>Plan of Action: A decade of experience demonstrates that sufficient technologies will be identified in this years total from the final report to exceed the target. The program project activities are consistent with the historic conversion of ten or more technologies being commercialized by industry. These data are collected at the end of the year through an annual survey.</p>	<p>MET GOAL</p>
<p>FY 2001</p>	<p>In FY 2001, commercialized ten new technologies from both the nine vision industries as well as the crosscutting programs.</p>	<p>MET GOAL</p>

FY 2000	There were no related Targets for FY 2000.	N/A
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Annual Target for FY 2003		Assessment
ER1-2b	6,200 energy-intensive U.S. plants that will apply EERE technologies and services achieving up to a 15 percent improvement in energy productivity per plant.	Met 100% of the Target
<p>Commentary – ITP met the goal of 6200 plants for FY 2003, and expects that, as plants contacted within the fourth quarter of FY2003 continue to be added to the database, the goal will be exceeded. Energy productivity per plant is energy used per dollar of output.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-2c	Turn over 25 percent of projects in the R&D portfolio.	Met 100% of the Target
<p>Commentary – Based on a study of project turnovers (projects either completed or terminated) conducted by June, 2003, the project turnover percentage for FY 2003 was 41.9 percent.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-2d	Help industry save more than 180 trillion Btu of energy worth at least \$720 million. (Assumes industrial average energy prices of \$4.00 per million Btu.)	Met 100% of the Target
<p>Commentary – ITP completed the training exercises and Allied Partnership agreements.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Assist industry in saving more than 265 trillion Btu of energy, worth more than \$1.6 billion. Result: Estimated energy savings directly attributable to industry programs (including commercialized technologies, best practices and the Industry Assessment Centers) were over 350 trillion Btu worth \$1.45 billion (equivalent to over \$1.85 billion in 2000 dollars), exceeding the program goal.	MET GOAL
FY 2001	(2) In FY 2001, OIT helped industry save an estimated 262 trillion Btu of energy worth more than \$1.6 billion.	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from 2002-2000		Assessment
FY 2002	<p>Target: Complete two showcase demonstrations of advanced energy efficient technologies at industry sites. Result: One showcase has been completed at Augusta Newsprint in Georgia. The second showcase, “The Texas Technology Showcase,” will focus on chemicals and petroleum refining industries and will be broadened to include sessions on other EERE technologies, including wind, Clean Cities, FreedomCAR, cogeneration/CHP, bioenergy, and hydrogen fuel cells. The showcase was held March 17-19th, 2003, in Houston, Texas, in conjunction with five participating companies and over ten corporate or organizational sponsors. Given the expanded breadth of this new approach, the outcome is anticipated to be much greater in terms of energy savings, since many EERE technologies will be involved. Principal second showcase direct goals have been completed, including plant-wide energy efficiency evaluations and staff training in using best practices tools. The event has been postponed to add value to the industry, sites, and DOE investment by broadening content and participation.</p> <p>Plan of Action: The Office of Industrial Technologies in conjunction with other EERE programs, states and EERE Regional Offices has examined and planned broadening this successful approach to technology demonstration to include other EERE technologies that can impact the industrial sector, including building technologies that account for over 10% of industrial energy use as well as distributed energy and renewable energy technologies.</p> <p>Target: Complete 20 new Allied Partnerships (formal agreements between industry and DOE’s Industrial Program) with energy intensive companies, trade organizations and other groups. Result: In FY 2002, 35 new Allied Partnership Agreements were signed, including 14 signed in the fourth quarter of FY 2002.</p> <p>Target: Continue support for Industrial Assessment Centers operating at 26 participating universities that will conduct over 600 combined energy, waste, and productivity assessment days of service to manufacturing clients. Result:</p>	<p>NOT MET</p> <p>MET GOAL</p> <p>MET GOAL</p>

	Industrial Assessment Centers operated at 26 participating universities. In FY 2002, 648 combined energy, waste, and productivity assessment days of service to manufacturing clients were achieved. Realized energy dollar cost savings from these plant assessments were over \$66 million, with an additional \$6 million in environmental waste savings and over \$54 million in productivity dollar benefits.	
FY 2001	Continued support for Industrial Assessment Centers operating at 26 participating universities that conducted approximately 650 combined energy, waste and productivity assessments.	MET GOAL
FY 2000	There were no related targets.	

Program Goal	Assessment
ER1-3: (1) by 2006, the Heavy Vehicle Systems activity develops technologies that will enable reduction of parasitic energy losses, including losses from aerodynamic drag, from 39 percent of total engine output in 1998 to 24 percent; (2) by 2010, Hybrid and Electric Propulsion R&D activities will reduce the production cost of a high power 25kW battery for use in light vehicles from \$3,000 in 1998 to \$500, with an intermediate goal of \$750 in 2006 enabling cost competitive market entry of hybrid vehicles; (3) by 2007, Advanced Combustion Engine R&D activities will reduce NO _x emissions in light duty diesel vehicles from 1.0 grams per mile (g/m) in 2000 to 0.07 g/m in 2007 and 0.03 g/m in 2010 and in heavy duty diesel engines from 2.0 grams per brake horsepower hour (g/bhp hr) in 2002 to 0.2 g/bhp hr in 2006 to satisfy the greater than 90 percent reduction required by the light duty Tier II and heavy duty 2007 federal standards, while maintaining or improving engine efficiency; (4) by 2006, Transportation Materials Technologies R&D activities will reduce the production cost of carbon fiber from \$12 per pound in 1998, to \$3 per pound; and (5) by 2007, Fuel Utilization R&D activities will identify an advanced petroleum-based fuel formulation that enables light and heavy duty Compression-Ignition Direct Ignition (CIDI) engine/vehicle systems to meet regulated emissions levels with minimum effect on fuel economy, and perform in full compliance with specified durability requirements.	Met 100% of the Goal
Commentary – All FY 2003 Targets were met.	

Annual Target for FY 2003	Assessment
ER1-3a Reduce high power 25 kW-estimated battery cost to \$1,180 per battery system.	Met 100% of the Target
Commentary – The target was met. A cost analysis for a battery that will deliver 25 kW pulses and meet other FreedomCAR goals related to weight, volume, cycle life, and calendar life predicts that complete battery systems would cost less than \$1,180 in production quantities of 100,000 batteries per year, down from \$1,367 in 2002. The prediction was based upon the cost of currently available technology developed by SAFT America, Inc. under a contract with the United States Advanced Battery Consortium (USABC). The USABC functions as a prime contractor to DOE under a cooperative agreement. SAFT provided the cost prediction as part of a final design review held during the third quarter of FY 2003.	

Related Annual Targets (FY 2002 – FY 2000)	Assessment
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FY 2002	Target: Achieve \$275/kW for a 50 kW fuel cell power system. Result: Two different cost analysis studies estimate the current 50kW fuel cell technology has achieved the \$275/kW price objective for production level fuel cells.	MET GOAL
FY 2001	Completed test and evaluation of a fuel-flexible 50 kW integrated fuel cell power system. (MET GOAL)	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-3b	Demonstrate optimized emission control system that achieves 0.07 g/mile NO _x and 0.01 g/mile PM short-term performance in light duty vehicles.	Met 100% of the Target
<p>Commentary – The target was met. The program demonstrated emissions targets for Tier 2, Bin 5 (0.07g/mi NO_x, 0.01g/mi PM). Established that the best approach for Light-Duty Diesel applications is NO_x Adsorber technology and Robust Particulate Filter. Demonstrated a Sulfur Trap Concept with 30,000 miles of operation. First generation 4-way system was evaluated, with 40% reduced catalyst volume to engine displacement ratio. 88% NO_x conversion efficiency with 5.6% fuel penalty was demonstrated for LDV over UDDS test cycle. 95% NO_x conversion with a fuel penalty of about 3% over the HFET. Demonstrated regeneration based on in-cylinder enrichment. Developed catalyst diagnostics based on spectroscopic surface analysis techniques.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	Light truck demonstration resulted in a 35% increase in fuel efficiency in a sport utility vehicle.	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-3c	Reduce parasitic losses of heavy vehicle systems to 30 % and benchmark additional reductions through heavy truck electrification.	Met 100% of the Target
<p>Commentary – This Target was met. On-road tests showed that the Pneumatic Heavy Vehicle (PHV) was able to improve the fuel economy of the truck at 65 mph by 5%. Wind tunnel tests showed a 10% increase in 65 mph fuel economy for a flat trailer extender and 5% increase in fuel economy for a cab extender. Super single tires showed a 3.5% fuel economy increase in field tests. Combined, these accomplishments will reduce parasitic losses to 30%, from 36% in 2002. Additionally, a bench test of the More-Electric Truck showed an 8% to 15% increase in fuel economy.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Reduce parasitic losses of heavy vehicle systems from 39% to 36%. Result: Exceeded the goal in 2002, demonstrating reductions of parasitic losses that can improve vehicle fuel economy by	MET GOAL

	approximately 12% through reductions in aerodynamic drag and through systems electrification.	
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-3d	Complete R&D on technology, which, if implemented in high volume, could reduce the price of automotive-grade carbon fiber to less than \$7/pound.	Met 100% of the Target
<p>Commentary – This target was met. Research was completed to develop the use of textile grade polyacrylonitrile (PAN) precursors rather than the more expensive grades of carbon fiber precursors via a subcontract with Hexcel Corporation. Developmental research was also completed to develop the use of microwave plasma as a production technology for carbon fiber. Line speeds of more than 200 inches per minute were achieved, which is more than twice as fast as conventional carbon fiber production lines. Economic analysis of this microwave technology indicates a total cost savings of \$1.50 per pound, which reduces the costs to \$6.50 per pound.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	Completed explorations of four approaches to lower-cost precursors for carbon fibers; down-selected and initiated further work on the two most promising approaches.	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-3e	Start identification of an advanced petroleum-based fuel formulation that enables light and heavy-duty CIDI engine/vehicle systems to meet regulated emissions levels with minimum effect of fuel economy, and perform in full compliance with specified durability requirements.	Met 100% of the Target
<p>Commentary – The Advanced Petroleum-Based Fuels activity published the results of 1,000 hour durability test in the Society of Automotive Engineers Technical Paper #04FL94. The paper is entitled, "Systems Approach to Meeting EPA 2010 Heavy Duty Emissions Standards Using a NOx Adsorber Catalyst and Diesel Particle Filter." This work was funded by the APBF-DEC Steering Committee and was conducted by Ricardo Engineering. The work was conducted on a Cummins 15 liter ISX diesel engine and the fuel used was an advanced petroleum based fuel that had a sulfur level of 15 parts per million.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Demonstrate 45% thermal efficiency for a heavy-duty diesel engine while meeting EPA 2004 emission standards. Result: Heavy-duty diesel engine thermal efficiency of 45% that met the EPA 2004 emission standard was demonstrated in December 2001.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from 2002-2000		Assessment
FY 2002	Target: Complete development of second-generation lithium ion electrochemistry for hybrid vehicle power. Result: The second-generation development of lithium ion electrochemistry for hybrid vehicle power is complete, with over 300 cells produced and tested, enabling specification and commercialization of the next generation battery materials for durable and cost effective performance in vehicles.	MET GOAL
	Target: Complete initial testing of light trucks with prototype diesel engines to demonstrate a 35% increase in fuel efficiency at Tier II emissions. Result: Completed initial testing of light trucks with prototype diesels demonstrating a 35% increase in efficiency and meeting Tier II EPA emissions standards by April 2002.	MET GOAL
	Target: Fabricate a sport utility vehicle chassis component using carbon fiber in a low cost molding process that is suitable for high volume production. Result: Substantial progress was made toward fabricating a sport utility vehicle chassis component using carbon fiber, in a low cost molding process suitable for high volume production. A critical molding machine breakdown and its repairs resulted in this target completion being deferred to January 2003. The delay did not affect achieving the long-term goal. Plan of Action: The machine was repaired (this diagnosis, design and reconstruction, however, set back the schedule three months). The project was completed in FY 2003.	NOT MET
	Target: Develop a prototype yeast capable of fermenting multiple biomass-derived sugars to meet cost goals for the ethanol/gasoline blend markets. Result: This effort has been postponed. The Congressional earmarks, nearly \$40 million for the Biomass Program in FY 2002, resulted in a major reduction in EE's discretionary resources aimed at biomass R&D. In addition, EE's management, in consultation with Congress, directed that the funding originally intended for the development of a yeast technology platform be included in the Biomass R&D broad-based solicitation issued in FY 2002.	NOT MET
	Plan of Action: If FY 2003 funding allows, EE will increase yeast R&D. Please note, however, that Congressional earmarks may require significant funding, resulting in fewer resources for our yeast platform work.	

FY 2001	Completed testing of the 276-volt battery aimed at demonstrating an integrated system having thermal and electrical controls.	MET GOAL
	Conducted a competitive solicitation and selected at least one partner for demonstrating the conversion of cellulosic feedstock at a corn ethanol plant.	MET GOAL
FY 2000	Worked with three domestic automakers to incorporate the most promising Partnership for a New Generation of Vehicles (PNGV) technologies in concept vehicles with up to three times the average fuel economy of the 1993 Taurus, Lumina, and Concorde models.	
	Launched two projects that will lead to 100% penetration of alternative fuel vehicles in selected niche applications, such as a local taxi fleet or the buses for a particular goal.	MET OR EXCEEDED GOALS
	Demonstrated conversion of agricultural wastes to ethanol at a small commercial scale using a genetically engineered fermentative microorganism.	

Program Goal	Assessment
<p>ERI-4: (1) By 2008, research, develop, and demonstrate at least 10 design packages for specific climates and home types that can achieve from 40 to 70 percent increase in the purchased energy efficiency of new prototype homes relative to the 2000 Model Energy Code, and 4 to 6 design packages that can achieve 20 percent increase in efficiency of existing homes; (2) Develop 5 to 7 design packages that can achieve an average of 40 percent increase in the purchased energy efficiency in applicable new commercial buildings or 15 percent increase in existing prototype commercial buildings; (3) Introduce 5 new cost-effective, ready for transition to market, efficient building products through component and equipment R, D& D activities; (4) By 2009, complete 30 formal proposals to enhance national building codes, and 20 final rules enhancing product minimum efficiency standards and test procedures; and (5) by 2010, develop 3 to 5 cost-effective, marketable Zero Energy Building (ZEB) design packages capable of satisfying 100 percent of whole-house energy requirements, net on an annual basis.</p> <p>Commentary – The residential building integration activities, through Building America (new residential construction) have developed five regional climate zones design guides that describe "best practices" systems that reduce space conditioning energy use by 30 percent. To date, 20,000 houses that serve as models in different climate regions use techniques developed by Building America builders and influence the builder partners in the Environmental Protection Agency's residential building ENERGY STAR program. The Commercial Buildings Program has demonstrated how a broad set of technologies can be employed to dramatically reduce energy consumption in case studies of six actual buildings. Performance data from these case studies will give designers immediate guidance on selecting technologies and applying design strategies to improve their current designs, and also provide a basis for DOE to develop design packages for a wide range of cost-effective commercial buildings at much higher levels of performance. The Emerging Technologies Program has demonstrated how to optimize the selection of new heat pump and air conditioning systems that conserve energy, reduce duct energy and air leakage and developed a drop-in heat pump water heater that improves efficiency by 50%, and reduce peak load for heating and cooling. This program also sponsored a design competition for lighting fixture design to accommodate the energy efficient compact florescent light bulbs that cut energy use by nearly 75% for each bulb. The Appliance Standards Program developed test procedures for dishwashers with soil sensors that provide a realistic test load of soiled dishes. This allows more accurate energy ratings so that consumers can compare the energy costs among dishwasher models. In addition, minimum energy efficiency standards rulemaking analyses for three priority standards rulemakings are continuing, and test procedure rulemaking for two products are nearing completion.</p>	Met at or Above 80%, but Below 100%, of the Goal

The Zero Energy Building Program issued a solicitation for integrating solar thermal and photovoltaic systems on residential buildings and awarded four contracts. These will be constructed within the Building America program to maximize the publicity and technology transfer potential

Annual Target for FY 2003		Assessment
ER1-4a	Pursue six promising technical solutions considering regional and housing type differences targeting 40 percent reductions in residential space conditioning, hot water, and lighting loads. Based on Building America systems research results, develop regional Building System Performance Packages for five climate zones describing “best practice” systems that reduce space conditioning energy use by 30 percent.	Met 100% of the Target
<p>Commentary – The Building America consortia for new homes developed the following prototype technical solutions for 40% or better energy savings from the International Energy Conservation Code (IECC): CARB developed Best Practices for Hot Humid Climates; BIRA developed a prototype designs guide for hot dry climates; BSC reported on several prototype designs for cold and hot dry climates; and finally, IBACOS describes two prototypes, one for a mixed humid and one for a hot climate, in their "Base Case House System Design and Builder Research Projects at 40% Energy Savings" report. CARB has two reports on Best Practices for 30% energy savings for hot dry and cold climates. Additionally, BSC in their "Houses that Work" reports have design guides for hot humid, mixed humid, cold and hot dry/mixed dry climates. BIRA also has a report for a design package for a hot dry/mixed dry climate.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Increase knowledge base of residential construction industry by pursuing six lines of research investigations focusing on industry identified priorities, e.g. low cost moisture protection, right-sized heating, ventilation and air-conditioning (HVAC) designs, super efficient distribution systems, etc.	MET GOAL
FY 2001	With Building America Partners, completed 3,000 energy efficient, environmentally sound high performance homes.	MET GOAL
FY 2000	In partnership with Building America, develop more than 2,000 highly energy-efficient, environmentally sound, and cost effective houses and disseminate results to builders of 15,000 other houses through PATH.	MIXED RESULTS

Annual Target for FY 2003		Assessment
ER1-4b	Facilitate a 10 percent increase in commercial building designs that have meaningful consideration of energy efficiency by developing improved design tools, including code compliance tools, and completing six research assisted design case studies in cooperation with industry.	Met 100% of the Target
<p>Commentary – Completed development, tested, and released two major versions of Energy Plus, with many new capabilities. Draft final reports were delivered for six case studies: Energy Performance Evaluation of a Low-Energy Academic Building - Adam Joseph Lewis Center for Environmental Studies, Oberlin College, Oberline, Ohio; Evaluation of the Low-Design and Energy Performance of the Zion National Park Visitor Center; Energy Design and Performance Analysis of the Big Horn Home Improvement Center; Monitoring and Analysis of the Energy Performance of the Chesapeake Bay Foundation's Philip Merrill Environmental Center; Energy Design and Performance Analysis of the Pennsylvania Department of Environmental Protection Cambria Office Building; NREL Thermal Test Facility: Evaluation of the Energy-Performance and Design Process. These case studies support the objective by providing a few real-world examples of how to apply a broad set of technologies to achieve energy savings up to 70% compared to a comparable code-compliant building. The case study data also provide a starting point for future program efforts in developing design packages and strategies for cost-optimized low-energy buildings covering a wide range of climates and building types.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Complete at least 850 highly resource-efficient, cost-effective homes through the Building America consortia, bringing the total number of homes built through the program to more than 4,500.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-4c	Complete investigation of five methods to increase the optimum selection of equipment components for air conditioning and heat pumps.	Met 100% of the Target
<p>Commentary – The Annual Target was met</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Publish one proposal for upgrade to the Federal Residential Building codes, and one proposal for upgrade to the Federal Commercial Building codes.	NOT MET
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-4d	Conduct four rulemakings to amend appliance standards and test procedures.	Met less than 80% of the Target
<p>Commentary and Plan of Action – In FY 2003, the Department expected to publish at least three Advance Notices of Proposed Rulemaking (ANOPR) regarding energy conservation standards and at least one test procedure final rule. DOE published a final rule in the Federal Register regarding test procedures for dishwashers. However, the three ANOPRs have been delayed. The engineering and economic analyses regarding energy conservation standards for three appliances (electric distribution transformers, residential furnaces and boilers and commercial central air conditioners and heat pumps) have been completed, however, the Departmental mandatory concurrence is ongoing, taking longer than scheduled. Once mandatory concurrence is complete, the ANOPRs will be submitted to the Federal Register for publication. Three ANOPRs are expected to be published Federal Register by the second quarter of FY 2004.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-4e	Expand ZEB teams to include more climates and continue partnership with industry to more fully integrate solar electric and thermal energy into buildings.	Met 100% of the Target
<p>Commentary – The Building America consortia for integrating renewable energy systems on energy efficient homes added four new homebuilder teams in the cold and severe cold climate zones during FY 2003. The project also advertised a solicitation for integrating solar thermal and photovoltaic systems on residential buildings, and awarded four contracts.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Program Goal	Assessment
<p>ERI-5: (1) By 2008, DEER Program will complete development and testing of a portfolio of distributed generation and thermally activated technologies that show an average 25 percent increase in efficiency (compared to 2000 baseline) with NOx emissions less than 0.15 grams/kWh; (2) by 2008, demonstrate the feasibility of integrated systems in three new customer classes, which could achieve 70 percent efficiency and customer payback in less than 4 years, assuming commercial-scale production; (3) by 2008, demonstrate the capability to double the power carrying capacity of transmission and distribution wires compared to that available in 2000, and (4) by 2012, develop a portfolio of technologies and software tools that allow real-time monitoring, understanding, and control of the transmission and distribution system by identifying over 90 percent of incipient system disturbances and cuing the operator for action as necessary (reducing response time through automated actions) to mitigate disturbance propagation.</p> <p>Commentary – In order to achieve these goals, the Distributed Energy Resources program has begun development of the first integrated combined heat and power system, and finalized plans for 17 distributed generation and thermally activated technologies demonstrations to be installed, some of which are in place today.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>ER1-5a Complete the 12 Beta Field Test Units of high efficiency natural gas fired heat pump (60 percent better than pulse combustion furnace) and install at field test sites hosted by major U.S. gas utilities.</p> <p>Commentary – At year end, 22 high-efficiency natural gas fired heat pumps have been built. Of these 22 units, 12 units have been installed. Testing indicates that this packaged heat pump prototype has set a world record Coefficient of Performance (COP) of 1.4.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003	Assessment
<p>ER1-5b Complete 4000-hour field test of ceramic composite shroud components to demonstrate performance and emission benefits to a gas turbine.</p> <p>Commentary – Successfully completed 5,366 hours of testing of the ceramic composite shroud. This is the first endurance test in a large gas turbine. Use of ceramic composite shrouds can allow turbines to run at higher temperatures, which may lead to reduced emissions and increased efficiency.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-5c	Contract with three companies to support research on demonstrating a 5 percent increase in efficiency for an advanced micro-turbine system.	Met 100% of the Target
<p>Commentary – Four companies are now under contract to research micro-turbine efficiency advances. Work with Capstone Corporation has resulted in a 200 kW micro-turbine that is 5 percentage points more efficient than the 28 percent baseline. Research with United Technologies Corporation has led to rig testing an integrated micro-turbine with an organic rankine cycle for improved electrical efficiency (5 percentage points). Two other companies are now under contract to research efficiency advances - Ingersoll-Rand and General Electric. Just recently under contract, research with Ingersoll-Rand and General Electric has not advanced to the point where efficiency gains have been realized.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Demonstrate a micro-turbine package (highly efficient for reducing peak loads) at a university site. Result: Completed a demonstration of a micro-turbine package at a university site in spring of 2002.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER1-5d	Increase the capability to reproducibly fabricate a 10-meter length of Second Generation HTS wire to carry 50 amps of electricity and 1-meter lengths that carry 100 amps from a 40-amp base.	Met 100% of the Target
<p>Commentary – The Target was met eleven months early. A partnership of American Superconductor and Oak Ridge National Laboratory, under DOE management, successfully developed second generation wire that carries 100 amps in 10-meter lengths. This success will decrease development time for superconducting wires that will enable higher capacity, more efficient and cost-effective power cables, generators, transformers, and other super-conducting alternatives to conventional electric grid technologies, perhaps as early as 2010.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	Document 6,000 hours (100% load) of operation of the first successful HTS' power delivery system to power an industrial use.	EXCEEDED GOAL

FY 2000	Installed the first industrial HTS electrical transmission cables at Southwire Plant in Carrollton, Georgia and began testing system reliability.	MET GOAL
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Annual Target for FY 2003		Assessment
ER1-5e	Support the field test of a 100kW lithium battery system for 700 hrs at a utility site.	Met 100% of the Target
<p>Commentary – This target was exceeded. Testing of an advanced Lithium-Ion energy storage system developed by Saft and Satcom was initiated. With a total running time of over 2400 hours, the target was exceeded by some 300%. Moreover, storage time, which was expected to be roughly one minute at 100kW, actually amounted to 3 minutes. The storage system one day can allow micro-turbines and other distributed generation devices to tolerate sudden and substantial alterations in electricity usage and respond to electricity outages in fractions of a second, instead of 15 seconds to a minute. In this way, it can improve both the efficiency and reliability of our Nation's electric ity grid.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Reduce gassing in sealed lithium ion batteries so that cells do not vent after five years of storage at full charge. Result: Demonstrated reduced gassing in sealed lithium ion batteries so that cells do not vent after 5 years of storage at full charge.	MET GOAL
FY 2001	Completed explorations of lithium-polymer and lithium ion battery technologies; lithium ion was selected as the most promising approach for continued development.	MET GOAL
FY 2000	Completed testing of baseline prototype, 50-volt high power lithium-ion modules for use in hybrid vehicles.)	MET GOAL

Program Goal	Assessment
<p>ER2-1: (1) Hydrogen Technology subprogram will develop and demonstrate hydrogen generation technology that will reduce the cost of producing hydrogen from natural gas from (untaxed) \$5.00 per gallon of gasoline equivalent in 2000, when produced in large quantities, to (untaxed) \$1.50 per gallon of gasoline equivalent in 2010; (2) Fuel Cell R&D activities will reduce the production cost of the hydrogen –or gasoline- fueled, 50kW vehicle fuel cell power system (including hydrogen storage) from \$275/kW in 2002 to \$45/kW in 2010 at production levels of 500,000 units per year (projected cost); (3) Stationary Fuel Cell R&D activities will increase the efficiency of natural gas or propane fueled 50kW stationary fuel cell systems from 35 percent in 2002 to 50 percent in 2010.</p> <p>Commentary – Meeting all technology and cost targets in the concurrent technology paths of hydrogen production, storage, and fuel cell power are key contributions to meeting the Hydrogen Posture Plan goals. The Department of Energy is actively executing its program plan by issuing competitive solicitations and making awards in key research areas such as hydrogen storage, hydrogen production and delivery, and fuel cell development. We are also implementing a national “learning” demonstration program to validate fuel cell vehicle and hydrogen infrastructure technologies under real-world conditions. The results of this technology validation effort will provide a feedback loop back into the R&D program. The partnership between the Department and the three domestic automakers has expanded to include five major energy providers to focus on critical hydrogen infrastructure challenges. The Secretary of Energy, in close coordination with the Secretary of State, has developed the framework for a new International Partnership for collaboration on pre-competitive research, codes, standards and protocols.</p>	<p>Met 100% of the Goal</p>

Annual Target for FY 2003	Assessment
<p>ER2-1a1 Verify low electricity and hydrogen production cost (<\$.08/kWh and <\$3.60/gal equivalent untaxed when produced in quantity) through cost shared operation of a 50kWe stationary fuel cell and hydrogen co-production facility for six months.</p> <p>Commentary – The 4th quarter hydrogen production milestone, "Complete subsystem R&D for an advanced steam reformer system", has been met, the GTI cooperative agreement has completed subsystem development for the major components of a steam reformer system including: a reactor and water gas shift subsystem, a pressure swing adsorption subsystem, a primary compressor, and a fast-fill dispenser subsystem. While the official DOE contractor quarterly status report requirement of 30 days after the quarter ends precludes official response, we expect the integration of the outputs from the quarterly milestones to demonstrate achievement of the annual target cost goal.</p>	<p>Met 100% of the Target</p>

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER2-1a2	Complete design of the 5,000 psi cryo-gas tank and 10,000 psi compressed gas tank to achieve 1.3 kWh/kg and 1.0 kWh/l.	Met 100% of the Target
<p>Commentary – The annual target was met in spite of the 4th quarter milestone being only partially met. The solid state storage component of the 4th Quarter milestone completing a 1-kg prototype, was not met. The planning milestone date was based on the initial proposal which involved a 3-yr work effort and an August 2001 start date. The start date was delayed nine months due to the Continuing Resolution and the work effort was stretched over four years so that we could fund more projects. As a result, the milestone date was changed to August 2004. In an oversight on the part of the continuing resolution revision process, the program request to change the quarterly milestone from 'complete' to 'design' was overlooked. This interim milestone has no impact on the storage target. The Design of 5,000 psi cryo-gas tank has been completed, the pressure vessels successfully passed cryogenic drop and bonfire testing, and a preliminary procedure for certification was drafted; the 10,000 psi compressed gas tank design has been completed; DOE has initiated negotiations with the contractor to begin the final phase of development which will focus on cost reduction.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Construct process development unit of ceramic membrane system for membrane system tests for hydrogen production.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER2-1b1	Achieve \$225/kW for a 50 kW fuel cell power system.	Met 100% of the Target
<p>Commentary – PORVAIR, a DOE contractor, has demonstrated replicable results of their full-size bipolar plates manufactured by high rate processes in fuel cell stacks that meet physical and performance standards. Systems analysis modeling incorporating accomplished milestones demonstrates achievement of cost goal - \$225/kW.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Achieve \$275/kW for a 50 kW fuel cell power system.	MET GOAL
FY 2001	Complete test and evaluation of a fuel-flexible 50 KW integrated fuel cell power system.	MET GOAL
FY 2000	Complete testing of baseline prototype, 50-volt high power lithium-ion modules for use in hybrid vehicles.	MET GOAL

Annual Target for FY 2003		Assessment
ER2-1b2	Achieve 30 percent efficiency at full power for a natural gas/propane 50kW stationary fuel cell. Plan technology validation activity.	Met 100% of the Target
<p>Commentary – Fuel cell energy was planned and validated with performance of a Membrane Electrode Assembly (MEA) operating at 120C in a 300cm2 fuel cell stack systems analysis, incorporating milestones that demonstrate achievement of 30% efficiency at full power for natural gas/propane 50kW stationary fuel cell.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Achieve 29 percent efficiency at full power for a natural gas of propane fueled 50kW stationary fuel cell system.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from 2002-2001		Assessment
FY 2002	<p>Target: Construct a process development unit of a ceramic membrane system for membrane system tests for hydrogen production. Result: A ceramic membrane process development unit has been constructed and testing has begun.</p>	MET GOAL
	<p>Target: Complete initial testing of Detroit superconducting transmission cable and document operational costs and reliability. Result: Cables have been ordered, received and installed. However, small leaks in the vacuum cooling tube have prevented testing to date. Two cables have been removed for testing at the lab and one remains in place.</p>	NOT MET
	<p>Plan of Action: We are working on addressing the leaks in the vacuum cooling tubes and concurrently trying to determine whether the remaining installed cable can be tested and provide sufficient information for documenting operational costs and reliability. In the event that this test cannot be performed at the Detroit site, we have begun to work with other utilities to find appropriate sites/partners to do similar testing.</p>	
	<p>Target: Convene and support the principals to enable IEEE to publish the draft P1547 Standard for Distributed Resources Interconnected with Electric Power Systems. Result: Convened and provided support to principals to develop the standard. The standard is complete, and has been reviewed and passed. IEEE members voted from August 28-September 28, and 90% affirmed the new standard.</p>	MET GOAL
	<p>Target: Complete 300 hours of testing of the advanced bromine battery system in partnership with Detroit Edison. Result: System has been tested for 300 hours</p>	MET GOAL

FY 2001	Installed first-of-a-kind superconducting electrical transmission cables to replace existing delivery to an urban substation serving 14,000 customers in Detroit, Michigan and begin testing operation and reliability.)	MET GOAL
FY 2000	Demonstrated fully autonomous operation of a 10 kW dish engine system for off-grid applications.	MET GOAL

Program Goal	Assessment
<p>ER2-2: The Wind Energy and Hydropower Program has the following overall performance goals: (1) by 2010, wind energy R&D activities will provide the technologies to reduce the cost of wind powered electricity generation in Class 4 wind areas from 5.5 to 3 cents per kWh; and (2) hydropower R&D activities will enable commercialization of a fish passage technology capable of reducing turbine-induced fish mortality from 5–30 percent to 2 percent or less.</p> <p>Commentary – The Wind Energy and Hydropower Program is on track with its performance goals. The Wind Energy R&D goal is on track, and the cost of energy in 2003 is estimated to be five cents.</p>	Met 100% of the Goal

Annual Target for FY 2003		Assessment
ER2-2a	Complete low wind speed turbine (LWST) conceptual design studies and fabricate and begin testing advanced wind turbine components optimized for low wind speed application initiated under industry.	Met 100% of the Target
<p>Commentary – The first of two LWST conceptual design studies was completed by Berger/ABAM. Regarding components, two drive-trains are being developed under the Low Wind Speed Technology public/private partnerships, and they are being tested at the National Wind Technology Center (NWTC) 2.5 MW Dynamometer test facility in FY 2003 through 2004.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	Moved advanced wind hybrid control system technology, developed jointly with USDA Agricultural Research Center, to commercial availability.	MET GOAL
FY 2000	Installed and began testing of two proof-of-concept turbines under the Next Generation Turbine program, leading to commercial availability of technology capable of producing electricity at 2 ½ cents per kWh in 15 mph wind resource by 2003.	MET GOAL

Annual Target for FY 2003		Assessment
ER2-2b	Complete the pilot-scale testing of a fish friendly hydroelectric turbine, providing the basis for future full-scale testing at an operational site. Successful testing will provide industry with a proven design, helping attain the 2 percent mortality goal.	Met 100% of the Target
<p>Commentary – In December 2002, the program completed successful pilot-scale testing of the new design Alden Turbine. In August 2003, the Hydropower program decided not to advance the Alden turbine to full-scale testing, believing that the results from the pilot-scale tests were sufficient for private industry to make the implementation decisions.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001	N/A
FY 2000	Demonstrated two advanced industrial turbine system engines at end-user sites.	MET GOAL

Program Goal	Assessment
<p>ER2-3: (1) By 2010, develop and verify gasification technologies which enable the increased efficiency of biopower systems from the current 20 percent efficiency to 30-35 percent; by 2010, complete development and field verify the efficiency of next generation, small, modular, biopower generation systems, with a unit cost reduction of 50 percent from the 11 cents per kWh baseline in 2000 to 5.5 cents per kWh (as stand alone systems outside of the biorefinery); (2) by 2005, develop the bioconversion technologies necessary for reducing the production cost of cellulosic ethanol from \$1.40 to \$1.20 per gallon, and, by 2010, to \$1.07 per gallon, through technology improvements for the co- production of ethanol, electricity, and bio-based chemicals (this cost is equivalent to the cost of high value petroleum based additives that refineries must pay in order to produce gasoline that satisfies octane and emission requirements specified by EPA and the automobile manufacturers); (3) by 2008, develop and verify in a demonstration biorefinery, the technologies and systems needed to co-produce at least one cost competitive biobased chemical or material product, along with biofuels and/or biopower. By 2010, through collaborative research projects with industry, universities and national laboratories, develop and verify cost competitive, energy efficient, process technologies for biobased products that will enable, by 2020, a domestic market of at least 50 billion lbs per year of biobased products — an increase of more than threefold — from current sales of about 15 billion lbs/yr; (4) by 2009, develop and demonstrate gasification technology for solid biomass (hog fuel) with an interim cost goal of 5.4 cents per kWh; by 2012, develop and demonstrate fully integrated, high efficiency black liquor and solid biomass gasification/combined cycle systems with an electricity cost of 3.7 cents per kWh and thermal energy efficiencies equal or better than the current 65 percent for steam generation in the forest products industry.</p> <p>Commentary – Advances and completions in the four bio targets maintain the technology road map goals needed for bio products to move into the marketplace at competitive prices. Termination of the soy project (ER-2-3d) and the brief delay in gasifiers (ER2-3b) does not adversely effect overall performance goal completion.</p>	Met less than 80% of the Goal

Annual Target for FY 2003	Assessment
ER2-3a	Develop an improved enzyme preparation for reducing the cost of producing ethanol from biomass. Evaluate its impact on production costs using an updated computer model of the production process.
<p>Commentary – The industry partner Genencor International developed an improved enzyme preparation for reducing the cost of producing ethanol from biomass in FY 2003. The partner worked with DOE to evaluate its impact on production costs using a metric equation of the production process developed by NREL. The NREL metric runs made in June - August 2003 show that the enzyme cost was reduced by 90 percent from the FY 2000 baseline, and is estimated at \$0.40/gallon of ethanol produced using the enzyme metric equation. This results in \$0.14 per lb of dilute, mixed biomass sugars suitable for fermentation to ethanol, based on</p>	

current experimental data for the biomass to ethanol process. The program target is \$0.07 per pound of sugars by Year 2010.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Develop prototype yeast capable of fermenting multiple biomass-derived sugars to meet cost goals for the ethanol/gasoline blend markets.	NOT MET
FY 2001	Conduct competitive solicitation and select at least one partner for demonstrating the conversion of cellulosic feedstock at a corn ethanol plant.	MET GOAL
FY 2000	Demonstrate two advanced industrial turbine system end-user sites.	MET GOAL

Annual Target for FY 2003		Assessment
ER2-3b	Establish testing program at three existing gasifiers at partner sites for the development and application of technology components (e.g. gas clean-up, gas engines, fuel cells, etc.) that need to be integrated with the gasification components to produce power, fuels, and chemicals.	Met less than 80% of the Target
<p>Commentary and Plan of Action– A steam reforming catalytic tar-conditioning reactor (SRCTC) has been designed for installation in NREL’s thermo-chemical pilot development unit (TCPDU) to test tar-cracking catalysts needed to reduce the concentration of condensable organics to a level acceptable for fuels and chemicals synthesis. Prentex Alloys has been tasked to fabricate the reactor and ancillary equipment under a capital equipment subcontract. A preliminary reactor design report is available. Extended contract negotiations caused a 3-month delay in the expected delivery of the reactor, which will now arrive in November or December 2003. Installation will be completed by February 2004. A completion report of reactor design and preliminary operation will be delivered in late September 2004. A related project involves operating a C-30 Capstone micro-turbine (15-20 kW expected output at 610 mm Hg atmospheric pressure with syngas) as an integrated gasifier-power system on syngas generated in NREL’s TCPDU. Performance and emissions results on hydrogen-rich fuels will be compared to operation on natural gas demonstrating the suitability of cleaned syngas for biorefinery utilities operations. Work was performed with the technical assistance of Capstone through an existing Cooperative Research and Development Agreement (CRADA). Experimental data collection was completed and a report detailing the results will be available in October 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER2-3c	In partnership with industry, complete pilot scale demonstration of two new biobased product technologies for economic, technical, and product performance.	Met 100% of the Target
<p>Commentary – In partnership with industry, completed pilot scale demonstration of a new bio-based product technology for economic, technical, and product performance. The industry partner (Amalgamated Research, Inc.) completed pilot-scale separations of acid/sugar hydrolysates in FY 2003. The Biomass Program's original target said "...demonstration of two new bio-based product technologies." The industry partner's proposal identified two approaches to accomplish the filtration of beet juice and hydrolysate. It was determined that the cross-flow filtration approach per our embedded membrane discoveries was far superior (for all applications) to the spinning filtration approach. As such, the spinning filtration approach was dropped for technical reasons. All efforts were then focused on the cross-flow embedded membrane filtration approach.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER2-3d	A 2-cycle engine oil derived from soy oil is commercialized for the emerging bioproducts industry.	Met less than 80% of the Target
<p>Commentary and Plan of Action– A 2-cycle engine oil derived from soy oil will be commercialized in the second half of FY 2004 for the emerging bio-products industry. This Target slipped because field testing took longer than originally estimated. Poor contractor performance resulted in suspension of financial support by DOE, and termination of the contract.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER2-3e	Complete the thermo chemical options analysis to assess various pathways to fuels (e.g., F-T, gasoline, diesel, alcohols).	Met 100% of the Target
<p>Commentary – In June 2003, NREL completed an analysis of thermo-chemical options for converting biomass to fuels and chemicals in order to focus on promising options in subsequent years. The Biomass Program's target of reducing the cost of cleaned and reformed synthesis gas to \$6.0 per million Btu by 2010 will allow the estimation of production costs of these fuels. An NREL C-Milestone Report entitled, "Syngas Analysis - Preliminary Screening, Technical Briefs, and Technical Barrier Assessment for Syngas to Fuels and Chemicals," documents this effort and the list of thermo-chemical pathways resulting from the analysis. This document will soon be released as an NREL Technical Report.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Program Goal	Assessment
<p>ER2-4: (1) By 2006, reduce the cost of grid-tied (battery free) photovoltaic systems to the end user (including operation and maintenance costs) to \$4.50 per Watt, from a median value of \$6.25 per Watt in 2000, which requires a reduction in the cost of the PV module itself to \$1.75 per Watt, compared with a current cost of \$2.50 per Watt and would reduce the average cost of electricity generated by PV systems from a current \$0.25/kWh to \$0.19/kWh; and (2) by 2005, reduce the cost of solar water heating from \$0.08/kWh in 2001 to \$0.04/kWh.</p> <p>Commentary – The reduction of PV module manufacturing costs to \$2.10 per watt meets and maintains the programs schedule to achieve \$1.75 per watt by 2006, which is integral to the overall goals of the program.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>ER2-4a Reduce manufacturing cost of PV modules to \$2.10 per watt (equivalent to \$0.19 to \$0.24 per kWh price of electricity from an installed solar system).</p> <p>Commentary – The Solar Energy Technology Program performs an annual survey of PV module manufacturing costs. Analysis of the results of the survey, which was conducted during the third quarter of FY 2003, showed that PV manufacturing costs has been reduced to the target level of \$2.10 per Watt. The survey data are provided by industry members on a voluntary basis.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Reduce manufacturing cost of PV modules to \$2.25 per watt (equivalent to \$0.20 to \$0.30 per kWh from an installed solar system).</p> <p>Result: The manufacturing cost of crystalline silicon PV modules is now less than \$2.25 a Watt completing this objective.</p>	MET GOAL
FY 2001	Developed a 14% efficient stable prototype thin-film photovoltaic module.	MET GOAL
FY 2000	<p>Developed a 13% efficient stable prototype thin-film photovoltaic module.</p> <p>Plan of Action: Siemens Solar, Inc. has produced prototype copper indium diselenide (CIS) modules that were measured at the Department's National Renewable Energy Laboratory (NREL) at 12.9% efficiency—essentially meeting the goal. CIS is the most promising film for meeting the program's cost goals. Achieving nearly 13% validates the feasibility of low-cost commercial modules that can become more cost competitive than today's crystalline silicon technologies.</p>	NEARLY MET GOAL

Program Goal	Assessment
ER2-5: By 2010, the levelized cost of power will be reduced from 5-8 cents in 2000, to 3-5 cents per kWh.	Met 100% of the Goal
<p>Commentary – Important advances toward meeting this goal were made in FY 2003 with the bench-testing of prototype air-cooled condenser enhancements, successful field testing of PPS coatings in several geothermal applications, and refinement of instrumentation for more precise monitoring of process conditions. Field testing of a Diagnostics-while-Drilling (DWD) system with state-of-the-art drag-cutter drill bits in FY 2003 provided data that confirms the performance improvement attained by using DWD. In FY 2003, the Geothermal Resource Exploration and Definition project continued to support field activities leading to the definition of new geothermal resources. Testing viability of small-scale systems is integral to reducing levelized costs. The no-go decision provides lessons learned for future projects and does not impact the long-term goal.</p>	

Annual Target for FY 2003	Assessment
ER2-5a Support industry opening and initial operation of a 1 MW small-scale geothermal power plant in the State of New Mexico.	Met 100% of the Target
<p>Commentary – A "no-go" decision on the 1 MWe small-scale power plant project in New Mexico was reached on August 23, 2003 when Americulture, the private-sector partner on the project, failed to secure financing for its 50% share of the project costs. The “no” decision precipitated project termination.</p>	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Complete construction of a small-scale (300 kW to 1 MW) geothermal power plant for field verification. Result: Design and environmental assessment of AmeriCulture 1 MW facility in New Mexico was completed.	MET GOAL
FY 2001	Selected industrial partners to build two cost-shared geothermal power plants using Enhanced Geothermal System (EGS) technology.	MET GOAL
FY 2000	Completed two designs of advanced air-cooled condensers for geothermal applications. Plan of Action: In FY 2000 NREL developed improved designs for tube bundles, filed a patent for the design and began discussions with potential industry partners, including manufacturers to produce tubes and full heat exchangers for testing. The Idaho National Environmental and Engineering Laboratory (INEEL) has completed a design of finned condenser tubes and has begun laboratory testing of representative cross sections. A manufacturer who has joined the project as an industrial partner has tentatively agreed to provide prototype tubes for additional testing.	NEARLY MET GOAL

Program Goal	Assessment
<p>ER3-1 (1) From 2003 to 2011, complete weatherization upgrades for a total of 1.2 million low income households; (2) by 2008, award cumulative total of 280 grants to 56 States and Territories; (3) cumulatively for the years 2003 through 2007, complete 15 or more state collaborative industrial research, development, and field testing cooperative agreements; (4) from 2003 to 2007, provide technical assistance to facilitate Rebuild America partners' retrofitting of an additional 400 million square feet of commercial and public/institutional space, with average efficiency improvement of 18 percent; (5) from 2003 through 2007, provide access to energy efficiency information for 20 million consumer contacts; (6) by 2008, facilitate adoption of upgraded model residential and commercial building energy codes (10 percent improvement) in 20 additional states, and by 2008, train 10,000 architects, engineers, builders and code officials to use and enforce upgraded energy codes; (7) By 2007, work with Clean Cities coalitions to increase the number of Alternative Fuel Vehicles (AFV's) from 110,000 in 2001, to 250,000 in 2007, and 400,000 in 2010, leveraging an outcome of 1,000,000 AFV's, consuming one billion gallons of alternative fuel by 2010; (8) from 2001 to 2010, increase the market share for ENERGY STAR windows from 25 to 40 percent, and market share for ENERGY STAR appliances from 15 to 25 percent; (9) from 2003 through 2008, fund 30 or more National Industrial Competitiveness through Energy, Environment and Economics (NICE3) industry partnerships for initial efficient technology demonstrations; (10) from 2003 to 2008, competitively fund 75 or more inventors and small businesses to develop energy efficiency technologies; (11) cumulatively, from 2003 through 2008, fund international technical assistance projects for sustainable energy planning in 7 or more new towns or cities, sponsor 3 or more renewable energy workshops, and fund foreign participation in 15 or more expert forums; (12) support to the maximum extent practicable DOE international goals and specific commitments contained in bilateral and multilateral agreements; and support the Clean Energy Technology Exports (CETE) initiative for joint public-private cooperation to increase the export of U.S. products and services; and (13) from 2003 to 2008, fund technical assistance to Native American Tribes in support of 50 or more economic development projects, 15 or more feasibility studies, and 15 or more workshops to promote energy efficiency and renewable energy resource development on Tribal lands.</p>	<p>Met 100% of the Goal</p>
<p>Commentary - The Office of Weatherization and Intergovernmental Program met or exceeded all four program targets. The Weatherization Assistance Program awarded \$233 million in FY 2003 funds. We estimate the actual number of homes weatherized was 102,113 homes bringing the cumulative number of homes to over 5.2 million. Rebuild America assisted 450 community partnerships to upgrade over 87 million square feet of floor space in K-12 schools, colleges, public housing, and state and local governments. The Clean Cities program coalition partners achieved over 151,000 alternative fueled vehicles in operation as well as adding almost 270 new public and over 300 new private alternative fuel stations. Energy Star program significantly exceeded its goal adding 18,838 stores by adding a large retail chain, a number of stores from a hardware buying cooperative, and a large number of independent local appliance stores through regional market transformation group partners in the Northeast, Midwest and California.</p>	

Annual Target for FY 2003		Assessment
ER3-1a	Award \$223 million in FY 2003 funds through 53 Weatherization program grants, including all 50 states, to enable the direct weatherization of 93,000 homes. This will bring the cumulative number of homes weatherized to over 5.2 million.	Met 100% of the Target
<p>Commentary – The annual target was exceeded. The Weatherization Assistance Program awarded \$233 million in FY 2003 funds. We estimate the actual number of homes was 102,113 homes bringing the cumulative number of homes to over 5.2 million.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Weatherize 105,000 homes, bringing the total number of homes weatherized to 5.1 million. *The weatherization assistance program reassessed the total number of homes weatherized between FY 2001 and FY 2002. Result: The program weatherized 105,000 homes in FY 2002. 100% of grants were awarded.	MET GOAL
FY 2001	Weatherized 75,350 homes, bringing the total number of homes weatherized to 4.8 million.	MET GOAL
FY 2000	Weatherized 68,000 homes, bringing the total number of homes weatherized to 4.8 million.	EXCEEDED GOAL

Annual Target for FY 2003		Assessment
ER3-1b	Assist 450 Rebuild America community partnerships, upgrade 80 million square feet of floor space in K-12 schools, colleges, public housing, and State and local governments.	Met 100% of the Target
<p>Commentary – The annual success rate is attributed to the optimized deployment of the community energy program market transformation process model, and renewed interest nationwide in efficiency technologies with news of foreign oil uncertainties, coupled with the unprecedented continuation of historically low long term interest rates.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Establish 40 new Rebuild America community partnerships, and assist these communities to retrofit 80 million square feet of floor space in K-12 schools, colleges, public housing, and State and local governments. Result: Sixty-five new Rebuild America community partnerships were established in FY 2002. Retrofitted 90 million square feet of floor space in K-12 schools, colleges, public housing, and State and local governments.	MET GOAL
FY 2001	Established 40 new Rebuild America community partnerships, and assisted these communities to retrofit 80 million square feet of floor space in K-12 schools, colleges, public housing, state and local	MET GOAL

	governments.	
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER3-1c	Achieve a total of 135,000 alternative fuel vehicles in operation in Clean Cities which will displace 180 million gallons of gasoline and diesel a year.* *The Clean Cities program is comprised on 4,500 partners and 80 Clean City coalitions, which operate on a calendar year basis, with data collection and processing ending in spring of the following year. Annual program growth is expected to continue at more than 15 percent a year, this performance carryover from 2002 to 2003 is made to align the reporting cycles of the program and the annual performance plan.	Met 100% of the Target
<p>Commentary – In 2002, Clean Cities coalitions added over 9,700 light duty AFVs and over 7,400 heavy duty AFVs to their regions, bringing the total number of AFVs to 151,228 and displaced an estimated 200+ million gallons of fuel. The steady increase in heavy duty vehicles is significant since oil displacement is so much greater with these vehicles. In addition, coalitions added almost 270 new public and over 300 new private alternative fuel stations in 2002. In 2003, Clean Cities provided \$200,000 to stimulate an investment of over \$3,000,000 from USAID and USAEP to support future vehicle and infrastructure purchases by building capacity with training and information exchange. Selected and awarded over \$5 million in SEP grants in September 2003, including \$2.5 million in special project funding to pay the incremental costs of AFVs, building fueling stations and providing coalition support.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Achieve 135,000 alternative fuel vehicles in operation in Clean Cities. Result: Conservative estimates of growth in Clean Cities alternative fuel vehicles indicate more than 135,000 alternative fuel vehicles were in operation in Clean Cities by end of FY 2002.	MET GOAL
FY 2001	Supported the annual acquisition of 12,000 alternative fuel vehicles in the Federal fleet.	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER3-1d	Recruit 375 additional Energy Star partners including retail stores, utilities, and manufacturers.	Met 100% of the Target
<p>Commentary – ENERGY STAR has added 18,838 stores in FY 2003. ENERGY STAR was able to exceed its goals in 2003 by adding a large retail chain (Radio Shack), along with a large number of stores from a hardware buying cooperative (Do it Best Hardware) and a large number of independent local appliance stores through regional market transformation group partners in the Northeast, Midwest and California.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Recruit 500 additional retail stores, five additional utilities, and three additional manufacturers, bringing the total number of stores marketing ENERGY STAR appliances to 7,000. Result: DOE has recruited 8,475 additional stores, 41 additional utilities and 23 additional appliance manufacturers as partners in the ENERGY STAR program as of July 2002. The total number of stores marketing ENERGY STAR appliances now stands at 14,975.	MET GOAL
FY 2001	Recruited 400 new ENERGY STAR partners, bringing the total number of stores marketing ENERGY STAR appliances to 6,500.	EXCEEDED GOAL
FY 2000	Recruited five utility partners to promote ENERGY STAR products; an additional 500 retail stores to promote Energy Star products; and 40 window partners to promote Energy Star Windows.	EXCEEDED GOAL

Additional Targets from 2002-2000		Assessment
FY 2002	Target: Increase the knowledge base of the residential construction industry by pursuing six lines of research investigations focusing on industry identified priorities, e.g. low cost moisture protection, right-sized heating, ventilation and air-conditioning (HVAC) designs, super efficient distribution systems, etc. Result: Seven Research areas were completed. Specific research projects include: energy performance of insulated, unvented attics; development of low cost wood shear panels; energy impacts of ICS (Integral Collector Storage) solar domestic hot water preheat systems; evaluation of mixing performance of residential mechanical ventilation systems; development of high performance affordable housing; evaluation and mitigation of moisture problems in manufactured housing; evaluation of dehumidification systems for residential buildings; and evaluation of low energy buildings with onsite power generation systems.	MET GOAL
	Target: Complete at least 850 highly resource-efficient, cost-effective homes through the Building America consortia, bringing the total number of homes built through the program to more than 4,500. Result: Building America completed 1,700 homes in Fiscal Year 2002, bringing the total number of homes built through the program to more than 5,350. More homes were built than the original goal due to increased program success, increased program efficiency, increased builder participation, and reduced lead times to house completion.	MET GOAL
	Target: Publish one proposal for an upgrade to the Federal Residential Building codes, and one proposal for an upgrade to the Federal Commercial Building codes. Result: All supporting documents for commercial codes including the draft Notice of Proposed Rule are in the General Counsel's office of DOE for concurrence. Preliminary concurrence from various agencies and	NOT MET

	<p>FEMP has been obtained. Federal code staff work has been completed; significant comment response and redesign and timing of review currently underway by general counsel may result in delay for publication by one quarter.</p> <p>Plan of Action: The delay is due to the need to complete the Environmental Analysis and assessment of impacts. The plan of action is to obtain and incorporate comments and revisions, if any, complete revisions to Environmental Assessment, and submit the mandatory concurrence package. Approval could be delayed until the second quarter of FY 2003.</p>	
	<p>Target: Establish one High Performance Buildings Roadmap implementation framework, leading to the goal of 30% more energy efficient new commercial construction compared to 1996 standard practice. Result: The draft framework from the High Performance Building Roadmap was tested multiple times with actual building design projects in FY 2002. Draft guides for achieving low-energy commercial buildings are being reviewed, and final guidelines are to be published in early FY 2003.</p>	MET GOAL
	<p>Target: Issue two proposals for upgrades and five upgrades to appliance standards and test procedures. Result: Two proposals for appliance standard upgrades have resulted in Final Rules. The Residential Central Air Conditioner and Heat Pump, and the Final Rule for Dishwasher Test Procedure for Non-Sensor type machines were issued in the Federal Register in May 2002.</p>	MET GOAL
	<p>Target: Implement and improve WINDOW 5 for National Fenestration Ratings Council (NFRC) production runs; train and support NFRC simulators. Result: WINDOW version 5.1 was released to Industry on October 2, 2002 at a National Fenestration Rating Council NFRC meeting. A Simulation Training Manual and an improved optics database editor (allows for the formulation of advanced glazings including laminated glass) were also released with Windows. An improved heat transfer model, THERM 5.0, was also released. The suite of programs allows for heat transfer modeling of new designs that promote energy efficient product development at significantly lower cost than conventional prototype development.</p>	MET GOAL
	<p>Target: Conclude field demonstrations of heat pump water heaters with utility partners. Result: Concluded field demonstrations of heat pump water heaters with utility partners. Data was collected from 16 units over a year. Data analysis was performed and a draft report was produced in June.</p>	MET GOAL
FY 2001	<p>With Building America Partners, completed 3,000 energy-efficient environmentally sound high performance homes.</p>	EXCEEDED GOAL
	<p>Issued three proposals for upgrades and three upgrades to appliance standards and test procedures. WINDOW 5 was released and approved by National Fenestration Rating Council (NFRC); algorithms were adopted as an International Standards Organization (ISO) standard.</p>	MET GOAL
	<p>Completed Phase I field demonstrations of heat pump water heaters, with</p>	MET GOAL

utility partners.

FY 2000

In partnership with Building America, developed more than 2,000 highly energy-efficient, environmentally sound, and cost-effective houses and disseminate results to builders of 15,000 other houses through PATH.

NEARLY
MET GOAL

Plan of Action: Seeking additional support from PATH and other dissemination sources to meet dissemination goals.

Program Goal	Assessment
<p>ER4-1: Support the President's Clear Skies Initiative by completing in 2005 initial demonstration tests of technologies with potential to reduce: Mercury by 50–70 percent; NO_x to less than 0.15 lb/mmBtu at ¾ cost of Selective Catalytic Reduction (SCR); PM_{2.5} by 99.9 percent; and acid gases by 95 percent. By 2010, test technologies for advanced cooling, mercury reduction by 90 percent and 66 percent increase in byproducts utilization.</p> <p>Commentary – The Innovations for Existing Plants program is on track to meet both the 2005 and 2010 goals (ER 4-1) set in support of the President's Clear Skies Initiative. All of the 2003 GPRA annual targets and quarterly milestones related to this goal were met.</p>	Met 100% of the Goal

Annual Target for FY 2003		Assessment
ER4-1a	Complete preliminary field testing of alternative mercury control technologies representing at least three approaches for achieving 50% or greater removal.	Met 100% of the Target
<p>Commentary – This Target was achieved. Field testing of electro-catalytic oxidation, sorbent injection, and co-firing with advanced particulate collection, indicating best case potential for up to 85% mercury removal for specific combustion systems, was completed and demonstrates progress toward mid-term goal of achieving 50% to 70% mercury control and potential for achieving the 2010 goal of 90% mercury control.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	Completed pilot studies on mercury emission controls that augment existing pollution control technologies, and are expected to reduce mercury emissions by over 50% at less than half the cost originally estimated in EPA's December 1997 Report to Congress on mercury.	MET GOAL

Annual Target for FY 2003		Assessment
ER4-1b	Initiate developmental testing of SCR catalysts for reducing NO _x emissions from alternatively fueled boilers.	Met 100% of the Target
<p>Commentary – This Target was achieved. Slipstream testing was initiated for SCR catalyst evaluation, including long-term testing for catalyst performance and deactivation over a 6-month time periods, and testing for performance on alternatively fueled boilers, which supports the long-term goal for development of fuel flexible, zero-emissions technologies.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	Issue request for proposals for the commercial scale demonstration of technologies to assure the reliability of the Nation's energy supply from existing and new electric generating facilities.	MET GOAL
FY 2000	There were no related Targets for FY 2001.	N/A

Annual Target for FY 2003		Assessment
ER4-1c	Complete fine particulate monitoring in the Upper Ohio River Valley region; complete field testing of alternative particulate matter collection technologies representing at least two approaches for achieving 99.99 percent removal; initiate research of PM _{2.5} and mercury transport and deposition.	Met 100% of the Target
<p>Commentary – This Target was achieved. Alternative technologies for flue gas conditioning and for electro-core treatment (upstream ESP followed by a dry scrubber, particle pre-charger, and advanced separator) were studied in field trials directed at assessing potential of the technologies for achieving the near-term particulate control objective; work was initiated to examine fine particulate and mercury transport and deposition in the Ohio River Valley; and fine particulate monitoring in the Upper Ohio River Valley Region were completed.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Complete report characterizing concentration and composition of ambient PM _{2.5} as input to the EPA PM _{2.5} National Ambient Air Quality Standards (NAAQS) review. This data will help identify the impact of emission sources on air quality. Result: A comprehensive report on the DOE-NETL PM _{2.5} research program, including information on the concentration and composition of ambient PM _{2.5} in coal-burning regions and implications for coal-fired power plants, was presented on September 11, 2002, at the Air Quality III Conference, Arlington, Virginia. The report was subsequently transmitted to EPA for use in its review of the PM _{2.5} NAAQS.	MET GOAL
FY 2001	(1) Delivered to EPA two years worth of high-quality PM _{2.5} ambient monitoring data from the upper Ohio River Project.	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-1d	Initiate projects for developing technologies to address emerging electric utility/water issues and combustion byproducts utilization and disposal.	Met 100% of the Target
<p>Commentary – This Target was achieved. Solicitations for proposals were completed and selected projects for investigation of such topics as the effects of mercury in combustion by-product use, the potential for use of non-traditional water sources to reduce surface water and groundwater consumption, and advances in cooling water intake technology, were initiated in fulfillment of the 2010 goal for advances in power plant cooling systems.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Complete Phase I report characterizing concentration and composition of ambient PM _{2.5} emissions as input to the EPA PM _{2.5} National Ambient Air Quality Standards (NAAQS) review. This data will help identify the impact of emission sources on air quality.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	Complete pilot studies on mercury emission controls that augment existing pollution control technologies, and are expected to reduce mercury emissions by over 50 percent at less than half the cost originally estimated in EPA's December 1997 Report to Congress on Mercury.	MET GOAL

Additional Targets from 2002-2000		Assessment
FY 2002	There were no additional Targets for FY 2002.	N/A
FY 2001	Issued a request for proposals for the commercial scale demonstration of technologies to assure the reliability of the Nation's energy supply from existing and new electric generating facilities.	MET GOAL
FY 2000	Completed the first large scale (600 MW) test of selective non-catalytic reduction, which will allow coal-fired power plants to satisfy ozone transport (OTAG) requirements for reduction of emissions of oxides of nitrogen and also reduce fine particulate matter.	MET GOAL

Program Goal	Assessment
ER4-2: By 2008, complete development of an advanced coal power systems capable of achieving 50 percent thermal efficiency at a capital cost of \$1,000/kW or less.	Met 100% of the Goal
Commentary – The Advanced Power Systems program is on track to meet the 2008 goal (ER4-2) set in support of both the President’s Climate Change and Hydrogen Research Initiatives. All of the 2003 GPRA annual targets related to this goal were met.	

Annual Target for FY 2003		Assessment
ER4-2a	Establish the design basis for a one to five ton per day facility capable of determining engineering feasibility, defining technical performance, and establishing operating costs for oxygen separation using membrane technology.	Met 100% of the Target
Commentary – This Target was achieved. The design basis for the targeted facility has been established via Milestones 1 through 5. Milestone 6, a stretch milestone, went beyond the annual target requirement of a 'design basis' and will, when completed, produce detailed construction drawings.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-2b	Complete initial laboratory-scale performance testing of hydrogen separation membranes using simulated gas streams.	Met 100% of the Target
Commentary – This Target was achieved. Completed initial laboratory-scale performance testing of hydrogen separation membranes. A variety of systems for development of hydrogen separation membranes, which would contribute to achieving the mid-term efficiency and cost goals, were subjected to initial laboratory tests. Testing included initial examinations of the performance potential of membranes in achieving production rates considered to be desirable in commercial applications, and of structural characteristics and fabrication techniques needed for hydrogen separation membrane operations. One alternative membrane production milestone has been delayed but this did not affect the completion of the annual target.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-2c	Complete initial laboratory tests to determine performance capabilities of sorbents, sieves, and membranes for removing mercury, sulfur, nitrogen, and CO ₂ from gas streams.	Met 100% of the Target
<p>Commentary – This Target was achieved. Completed initial laboratory and bench-scale testing of sorbents and other systems. These tests identify approaches for achieving levels of sulfur, mercury, fine solid particles, nitrogen (as ammonia), and multi-contaminant (including CO₂) removal, which might be viable candidate approaches leading to a zero emissions plant, and for establishing facilities and capabilities to further test sorbent performance. One milestone, which offered an alternate method of removing solids, was not met but it did not impact overall achievement of the annual target.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-2d	Conduct gasification support tests on leachability of gasifier residues, improved refractories, and oxygen-blown gasification of alternative fossil fuel feedstocks, and develop a simulator for a Vision 21 plant.	Met 100% of the Target
<p>Commentary – This Target was achieved. Completed gasification support tests on leachability of gasifier residues (Milestone 12), improved refractories (Milestone 11), and oxygen-blown gasification of alternative fossil fuel feedstocks (Milestone 9 and 18), and develop a simulator (Milestone 20) for a Vision 21 plant. Of the four (out of 24) quarterly milestones not met, one (the pyrometer test) was not critical to the completion of the annual target, one was a stretch milestone (conceptual design to integrate gasifier into V21 system) that went beyond the annual target requirement, and two others were alternative paths to developing a simulator which was accomplished via an alternative milestone that was completed.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-2e	Develop technical and cost information sufficient for DOE decision-making on the viability of proceeding with plans for construction of a co-production plant.	Met 100% of the Target
<p>Commentary – This Target was achieved. Optimized process designs and economic evaluations were prepared for plants to co-produce power and liquid fuels, technical and cost proposal information was received for a co-production plant, and decision-making plans for proceeding with support of a co-production plant were established.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Complete initial tests of the IGCC transport gasifier to confirm the feasibility of the technology to significantly improve reliability, cost effectiveness, and efficiency for producing electricity and other products.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from 2002-2000		Assessment
FY 2002	<p>Target: Complete initial tests of the IGCC air-blown transport gasifier on bituminous coal, to determine the feasibility of the technology on high rank coals for significantly improving reliability, cost effectiveness, and efficiency for producing electricity. Result: The feasibility of using high-rank coals in the transport gasifier was demonstrated by completing a total of 180 hours of air-blown testing with Sufco bituminous coal at the PSDF in September 2002. The test went smoothly in the gasifier as well as the particulate collection device (PCD). The corrected heating value of the syngas is about the same using either the Sufco bituminous or Powder River Basin bituminous coal. A brief shutdown to inspect the reactor and PCD showed no damage or significant blockage. The transport reactor is a simpler design, with no internal parts to wear out rapidly, and cooler operation, which should help prolong refractory life, the biggest problem with slagging high-temperature, oxygen-blown gasifiers. More than 1,000 hours on bituminous coals will be needed to complete testing. The initial test completed during FY 2002 represents approximately 20% of the total needed to fully assess the technology. Southern Company Services has estimated total plant costs using a transport reactor to be 5-18% lower than for those employing existing gasifiers. They estimate the efficiency to be 46.0% versus 37.9-43.1% for commercial gasifiers.</p> <p>Target: Complete construction and start operations of Circulating Atmospheric Fluidized Bed demonstration project at Jacksonville, Florida. Result: The JEA Clean Coal Technology (CCT) “Large-Scale Circulating Fluidized-Bed (CFB) Combustion Demonstration Project” completed construction and startup operations at the Northside Generating Station in</p>	<p>MET GOAL</p> <p>MET GOAL</p>

	<p>Jacksonville, Florida. This plant, a 297.5-megawatt unit, delivered power to the grid beginning in February 2002, achieved rated output in May, and has been operating at 100% capacity on coal-fuel blends as a base-loaded unit since mid-summer. The two-year DOE demonstration testing period is scheduled to begin in January 2003.</p>	
FY 2001	<p>Demonstrated hydrogen and CO₂ separation from syngas to meet the long-term goals of providing low-cost hydrogen for high-efficiency fuel cells, and for providing concentrated CO₂ streams for sequestration.</p>	MET GOAL
	<p>Completed design and continue construction of the Circulating Atmospheric Fluidized Bed demonstration project at Jacksonville, Florida.</p>	MET GOAL
FY 2000	<p>Completed demonstration of the third integrated gasification combined cycle project (Pinion Pine) utilizing air-blown gasification and hot gas cleanup for improved thermal efficiency, and continued operations of one other project (Polk) in order to establish the engineering foundation leading to new generation of 60% efficient power plants.</p>	NEARLY MET GOAL
	<p>Plan of Action: Discussions with new owners of the Pinion Pine IGCC Plant will take place upon completion of the transfer of ownership of the plant.</p>	

Program Goal	Assessment
<p>ER4-3: By 2007 demonstrate at a pilot plant scale, technologies to reduce the cost of carbon dioxide separation and capture from new coal-based power systems by 75 percent compared to current (circa 2000) systems. By 2012, develop technologies that result in less than 10 percent increase in the cost of new energy services to separate, capture, transport, and sequester carbon using either direct or indirect systems.</p> <p>Commentary – The Sequestration program is on track to meet both the 2007 and 2012 goals (ER 4-3) set in support of the President’s Climate Change Initiative. All of the 2003 GPRA annual targets and quarterly milestones related to this goal were met.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>ER4-3a Complete initial set of field tests of advanced monitoring and verification methods for carbon inventories on natural and engineered terrestrial systems and establish a database for mid-continent planning of geological storage projects. Establish regional carbon sequestration partnerships.</p> <p>Commentary – Achieved. Organizational arrangements were completed for establishing seven regional carbon sequestration partnerships to recommend sequestration technologies for regional validation testing. Databases were developed on sources and sinks of CO₂ in Illinois, Indiana, Kansas, Kentucky, and Ohio, and data on CO₂ storage structures on the CO₂ plateau was established. Initial field tests were conducted for characterization of carbon inventories in terrestrial systems, and monitoring/verification of CO₂ storage in hardwood trees on poor quality terrestrial lands was initiated.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	For carbon sequestration, expand the number of possible cost-effective, collaborative, multi-national applied R&D options carried to the “proof of concept” stage. Complete multiple field experiments on promising technologies.	MET GOAL
FY 2000	Commence three to four small scale carbon sequestration development projects from those selected in the FY 1998 Novel Concepts solicitation, and initiate feasibility studies for one to two sequestration projects selected under FE’s August and September 1999 solicitations.	MET GOAL

Annual Target for FY 2003		Assessment
ER4-3b	Initiate evaluations of three novel concepts, comprising integrated sequestration with enhanced coal bed methane recovery, mineral carbonation, and CO ₂ flooding during enhanced oil recovery and establish initial recommendations for long-term monitoring of CO ₂ geological storage to assure acceptability as a safe, long-term storage option.	Met 100% of the Target
<p>Commentary – Achieved. Novel concepts were targets for evaluation of carbon sequestration, including projects for coal seam sequestration – including sequestration with enhanced methane recovery, for use of CO₂ in flooding tests – and actual operations – for enhanced oil recovery, and for carbonate mineral sequestration (see ER 4-3-c). Workshop gatherings were conducted to review and establish recommendations covering reservoir characteristics for sequestering CO₂.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-3c	Complete initial planning, field-testing, or analyses of sequestration concepts involving saline aquifer storage, ocean storage, and scientific feasibility of CO ₂ storage as hydrate on the ocean floor and complete initial comparative evaluation of energy technology scenarios to identify promising concepts for CO ₂ sequestration.	Met 100% of the Target
<p>Commentary – Achieved. Planning, evaluation, and/or testing were conducted for a variety of projects covering the areas of deep ocean storage, saline aquifer storage (including environmental assessment and initiation of a field test), and storage as a hydrate pool. At least 10 energy technology scenarios were evaluated to identify performance, investment costs, and economics of carbon sequestration.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from 2002-2000		Assessment
FY 2002	Target: Complete the injection of 2,500 tons of CO ₂ into a depleting oil reservoir to monitor the transport of CO ₂ and verify predictive geologic models on reservoir integrity. Result: This target was not met. The Bureau of Land Management did not issue the field operations permit that would lead to a favorable Record of Decision until the last week of September 2002. Also, the cost of the planned seismic survey has tripled since submission of the original proposal. This significantly higher cost resulted in a delay related to project funding adjustments. Instead of passing through Sandia National	NOT MET

Laboratories, funds for the seismic survey are being transferred directly to the industrial partner, Strata Petroleum, Inc., resulting in a cost-savings of \$300,000. This savings has helped to offset increased costs of the field operations.

Plan of Action: NETL will exert more control over planned project activities and budgeted activities being managed by other National Laboratories. NETL will have more visits to the project site and continuously during the various phases of the project and emphasize to the lead lab, the industry partners, and selected field operation contractors that the project needs to stay on the prescribed schedule. More frequent project team meetings will occur in order to evaluate what issues and progress is being made toward the required field activities. It is currently anticipated that, according to the project's revised schedule and plans for conducting field activities, the following tasks will be completed by the end of FY 2003: (1) pre-injection 3D surface seismic geophysical survey, (2) down-hole Vertical Seismic Profile geophysical survey, (3) injection of 2500 tons of CO₂ and micro-seismic monitoring, and (4) follow-up post-injection 3D surface seismic geophysical survey (after a several-week soaking period for CO₂).

Program Goal	Assessment
ER4-4: By 2010 introduce prototypes of: a) modular fuel cells with 10-fold cost reduction (\$400/kW) with 45 to 50 percent efficiency; b) fuel cell-turbine hybrids with a 60 to 70 percent efficiency adaptable for coal.	Met 100% of the Goal
Commentary – The Distributed Generation program is on track to meet the 2010 goal (ER 4-4) set in support of both the President's Climate Change and Hydrogen Research Initiatives. All of the 2003 GPRA annual targets and quarterly milestones related to this goal were met.	

Annual Target for FY 2003	Assessment
ER4-4a Communicate fuel cell program objectives and results and conduct peer-reviews through conferences, workshops, and website tools. Manage the PSPG R&D portfolio through assessment of results and selection of new projects to fill portfolio gaps.	Met 100% of the Target
Commentary – All planned milestones were met. New awards for two SECA Industry Teams and 10 Phase II Core Technology Program projects promise competitive SOFC concepts and focused R&D to meet SECA cost reduction and performance goals. Workshops and Peer Reviews successfully disseminated technology updates and allowed stakeholder feedback and R&D prioritization. Co-hosting by the California Energy Commission, the United Nations, and DOE EERE/FEMP, as well as Congressional participation, fosters collaboration, recognition, and relevance.	

Related Annual Targets (FY 2002 – FY 2000)	Assessment
FY 2002 Complete demonstration of a commercial-scale, 250 kW Molten Carbonate Fuel Cell (MCFC) power plant system. This test will verify the commercial design for the MCFC technology for the combined heat and power (CHP) or distributed generation (DG) market and, if	MET GOAL

	successful will justify the construction of a MCFC manufacturing facility in the U.S.	
FY 2001	Begin testing of a 300 kW-1MW solid oxide fuel cell/turbine hybrid commercial prototype for distributed power applications.	MET GOAL
FY 2000	Begin testing of first market prototype solid oxide fuel cell for distributed power applications.)	MET GOAL

Annual Target for FY 2003		Assessment
ER4-4b	Conduct cost reduction R&D programs involving near term developers, Siemens Westinghouse (SWPC) and FuelCell Energy (FCE), for the fuel cells, including manufacturing and Balance Of Plant (BOP) components. Commentary – All planned milestones were met. Design, construction, and testing of initial hybrid units and design of novel generation Ramgen concept promises unparalleled efficiency gains for future generations. FCE's integration of a larger micro-turbine has increased performance while decreasing supplemental requirements. SWPC's factory acceptance test also addresses integration issues.	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-4c	Conduct field test necessary to establish feasibility of high temperature fuel cell hybrids and novel systems, including design, procurement, construction, and testing. Commentary – All planned milestones were met. Innovative manufacturing techniques, material advancements, and equipment integration solutions promise significant cost reductions for commercialization applications. SWPC's new bundling machine reduces stack assembly from hours to minutes.	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-4d	Conduct contracted and in-house State Energy Conversion Alliance (SECA) core technology of crosscutting and proof-of-concept R&D for transferred to one or more industrial teams, including know-how, patents, licenses, reports, papers in peer reviewed journals, etc.	Met 100% of the Target
<p>Commentary – All planned milestones were met. Design and testing of stack designs by SECA industry teams provided validation of increased power density performance and decreased weight and volume configurations, leading to lower costs that will meet robust SECA specifications and goals. Delphi's Generation 2 unit is significantly smaller and one-quarter the mass of the first generation unit. Cummins achieved an 80 percent reduction in power degradation by lowering the temperature 50 degrees centigrade.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER4-4e	The SECA industrial team shall conduct stack design and testing, including manufacturing approaches, and materials and BOP systems optimization leading prototypes.	Met 100% of the Target
<p>Commentary – All planned milestones were met. Technology transfer from CTP projects to SECA industry teams provides the cutting edge research results needed to achieve concept breakthroughs and enable configuration optimization. In-house test facility development will provide independent evaluation of SECA prototypes, public domain data, and near-term assessment for other entities, e.g., EPA.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from 2002-2000		Assessment
FY 2002	Target: Restart and test the 220-kW hybrid solid oxide fuel cell (SOFC) microturbine power plant at the National Fuel Cell Research Center. If successful, this test will verify the commercial design for this particular SOFC technology for DG or CHP applications. Results: This GPRA target is complete. The unit was restarted and test results have verified the commercial design basis. Testing will continue for approximately 1,300 hours in order to satisfy the requirements of the industrial partner.	MET GOAL

	<p>Target: Complete development of manufacturing processes that will reduce MCFC stack and other component production reject rates, reduce product cost per kW, and improve throughputs. These improvements will be incorporated into a MCFC manufacturing plant boosting production capacity from 6 MW to 50 MW per year. Results: FuelCell Energy (FCE) has completed the construction of a 50-MW Molten Carbonate Fuel Cell (MCFC) manufacturing facility in Torrington, CT. Each of the process lines has been tested and has achieved the 50 MW run rate. FCE reports that the new manufacturing processes incorporated into the Torrington facility have reduced stack module costs by a factor of two. This was driven by reducing the cost of non-repeating hardware (such as stack end plates) as well as improvements in process yields for repeating components (the cells themselves). Balance-of-plant cost (\$/kW) has also been reduced by 40%.</p>	MET GOAL
FY 2001	<p>Began testing of a 300kW-1 MW solid oxide fuel cell/turbine hybrid commercial prototype for distributed power applications. (MET GOAL) Initiated construction of a fixed-bed slagging gasification and fuel cell demonstration project (Kentucky Pioneer Energy Project).</p> <p>Began construction of a one MW Solid Oxide Fuel Cell (SOFC) hybrid.</p>	MET GOAL
	<p>Plan of Action: This target is no longer applicable as a result of a program decision to redirect effort in this area to focus on further design improvements aimed at low-cost solid oxide fuel cell systems. Cancellation of this milestone to refocus the effort does not impact the higher-level objective or schedule.</p>	MET GOAL
FY 2000	<p>Began testing of the first market prototype solid oxide fuel cell for distributed power applications.</p> <p>In support of Vision 21, completed testing of a 250 kW fuel cell/turbine hybrid, and delivered a conceptual design of a 1 MW fuel cell/turbine hybrid power plant to facilitate market entry.</p> <p>Plan of Action: Tests on a 220 KW hybrid unit began in December 2000, for a 6-month testing period.</p>	MET GOAL
		NEARLY MET GOAL

Program Goal	Assessment
<p>ER5-1: By 2008, develop advanced technologies and employ scientifically based policy options to increase the Nation's economically recoverable resources by 15 TCF for natural gas and 140 million barrels for oil; and reduce future costs of exploration and production by \$10 billion. According to the USGS, EIA, and MMS, the economically recoverable oil resource base is estimated to be 120 million barrels at \$18/bbl and 149 billion barrels at \$30/bbl; the gas base is estimated to be 740 TCF at \$2.00/mcf and 920 TCF at \$3.50/mcf in 2002.</p>	<p>Met at or above 80%, but below 100%, of the Goal</p>
<p>Commentary – Two drilling technologies, short-radius composite drill pipe and Intellipipe, are reducing the overall cost of drilling oil and natural gas wells. Other noteworthy accomplishments: the Intellipipe offers 200,000 times more data transfer than current systems and will significantly reduce drilling costs by providing valuable down-hole data to drillers. The successfully demonstrated short-radius composite drill pipe is making shallow well drilling targets more economical by increasing the life expectancy of the drill pipe and thereby reducing overall drilling costs.</p>	

Annual Target for FY 2003	Assessment
<p>ER5-1a Complete basin model for the Wind River Basin and well site selection in Greater Green River Basin to evaluate integrated remote sensing, seismic surveys and basin structural analysis to differentiate gas-bearing from uneconomic fractured reservoirs, complete a conceptual model of regional water distribution to help operators avoid poor production areas, and build and have field ready an initial prototype of a 400-geophone receiver array to improve seismic resolution necessary to locate economically productive gas zones.</p>	<p>Met 100% of the Target</p>
<p>Commentary – All planned milestones were met. The conceptual model developed for the Greater Green River Basin and the 3-D basin model of the Wind River Basin will provide operators with vital information to avoid areas of high water production. The new 400-level receiver array is the highest resolution tool available in the industry, and provides five times the resolution of other tools. Geo-mechanical modeling has identified previously unrecognized faults that may be controlling production. These two technologies will allow operators to reduce their "dry hole" rate. The cement evaluation and testing will provide valuable information to allow service companies to perform more effective cement jobs.</p>	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Demonstrate safe economic slim hole drilling technology in actual use under Arctic conditions. This technology can significantly reduce cost and environmental impacts.	MET GOAL
FY 2001	Complete the demonstration of five advanced secondary and tertiary technologies. Based on models, it is estimated these technologies will increase near-term incremental production by 1.7 million barrels of oil, and long-term incremental production over 2.4 billion barrels of oil.	MET GOAL
FY 2000	Complete demonstration and transfer of seven advanced secondary and tertiary technologies, adding 92 million barrels of reserves, increasing the number of economic wells and reducing abandonment rates.	MET GOAL

Annual Target for FY 2003		Assessment
ER5-1b	Conduct two field tests of improved drilling technology that will improve the productivity of gas reservoirs and reduce drilling costs and two field tests of technologies to improve natural fracture detection to increase the percentage of economically producing wells of all wells drilled.	Met 100% of the Target
<p>Commentary – All planned milestones were met. The Intellipipe offers 200,000 times more data transfer than current systems and will significantly reduce drilling costs by providing valuable down-hole data to drillers. The short-radius composite drill pipe is making shallow targets more economical by increasing the life expectancy of the drill pipe and thereby reducing overall drilling costs. The test well in the Anadarko basin is verifying the geo-mechanical approach for fracture prediction and could improve the success of drilling economical wells. The arctic platform will reduce environmental impacts in Alaska and reduce drilling costs by making drilling viable year-round.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER5-1c	Increase access to the domestic oil reserves by using advanced technology. Focus on high-risk research (award six projects and issue one solicitation microhole technologies) for future applications on state and federal lands and waters, and on addressing nearer-term barriers. Select and award five projects with independents, and on a regional basis award four projects-PUMP. Award two projects in Advanced Technologies and select and award projects under the Broad Funding Announcement.	Met 100% of the Target
<p>Commentary – Awarded 38 projects, which were solicited and evaluated in a timely manner utilizing the fiscal year funding. This is significant because the new short-term field demonstration projects will provide small independent oil producers assistance in testing higher-risk technologies and transferring technology to them to keep oil flowing from thousands of U.S. fields, thus attaining mid-term oil and gas production metrics. These awards directly impact the Oil E&P Program's short to mid-term oil and gas production metrics. Issuing the microhole technologies solicitation gets the projects into the award process early in FY 2004. Short term projects (one year) will evaluate existing technology base, a goal based on the Microhole Technologies Roadmap Workshop. It is important to verify the existing technology base as soon as possible in order to establish an evolutionary technology development program resulting in low cost and/or cost effective technologies, which was also a Workshop recommendation. The longer, mid-term projects will provide cutting-edge research needed to attain long-term oil and gas production metrics, and are aimed at providing these tools to America's independent oil and gas producers. The model integration effort to combine the TORIS and GSAM programs into a single integrated system for oil and gas modeling will not only be key to metrics monitoring for technology development within the</p>		

Strategic Center for Natural Gas and Oil (SCNGO), but also will be a key evaluation tool utilized by other branches of government (e.g., MMS and BLM) to evaluate regulatory impact. Acquiring industry input to the SCNGO program is a critical PART evaluation element.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Demonstrate a small-diameter, lightweight composite drill pipe for ultra-short radius drilling.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER5-1d	Reduce the number of dry holes drilled in frontier areas, and increase near-term energy security through field testing (three projects) improved oil recovery techniques, seismic (one project), data acquisition (two projects); interpretation (one project) and streamflood simulation (one project) in existing light and heavy oil reservoirs at sites ranging from Alaska to Utah. Initiate full-scale field test of newly developed vibration sonic tool.	Met less than 80% of the Target
<p>Commentary – WHAT WE DID: Sonic simulation technologies SIGNIFICANCE: This project is behind schedule (See Plan of Action below) WHAT WE DID: Alaskan heavy oil recovery performance project, the streamline based, high resolution, 3D, fully compositional four phase reservoir simulator was completed and operational. SIGNIFICANCE: The completion marks the beginning of field analyses for optimization testing. WHAT WE DID: Vinton Dome metric-5 significant objectives resulted: built 3-D velocity/depth model from logs and stacking velocity analysis; completed physical models based on Vinton Dome velocity/depth; drilled and acquired 3-D VSP data; completed numerical & physical modeling for VSP data sets; and, evaluated benefit of Kirchhoff vs. phase screen VSP migration. SIGNIFICANCE: The following achievements noted: 1) Best Student Poster Award received from last year's International SEG meeting; 2) Six papers accepted to this year's SEG conference; and, 3) The University of Houston was named SUN Microsystems Geoscience Center of Excellence resulting in five million dollars of modern computer hardware. The project scope has been expanded via a no cost extension to utilize the new capability. WHAT WE DID: Two drilling projects included rotation drilling system commissioned on schedule and testing of new cuttings transport system under elevated temperature and pressure system. SIGNIFICANCE: These additions allow studies conducted in the facility to provide industry insights into requirements for extended reach drilling and drilling with entrained gas that were not previously possible. WHAT WE DID: Create and field test a reservoir model for the Circle Ridge Field that can then be used to design reservoir engineering processes to recover additional oil that would likely remain unrecovered. The Joule metric for field testing the fracture model was accomplished. SIGNIFICANCE: Marathon drilled a well based on the improved model and completed it with successful results (commercial). Production rates have not been released. WHAT WE DID: A working downhole vibration tool was built. The joule metric of initiating a field test of newly developed vibration sonic tool was accomplished. However, the field test was prematurely terminated when the tool got stuck while tripping the hole. SIGNIFICANCE: The project allowed development and demonstration of a vibration generator for potential</p>		

application in downhole stimulation on production rates in a mature, producing Osage Nation waterflood field. This success allows companies access to useful information to be used in designing the next generation vibration tool.

WHAT WE DID: : The overall objective of the horizontal well project was to overcome some of the limitations of waterflooding operations using vertical wells in shallow, naturally fractured, low permeability reservoirs and to show that it is technically and economically feasible to recover oil from the Bartlesville formation in the Woolaroc Field, Osage County, Oklahoma. This project is behind schedule and did not meet the Joule requirements (see **Plan of Action** below).

PLAN OF ACTION TO CORRECT DEFICIENCIES: There are two deficiencies in this section. FE reports that a sonic stimulation technology deficiency resulted when the required instrument was unavailable for field testing. The uncertainties resulting from these actions put this project behind schedule. It reflects the turmoil ongoing within the U.S. Domestic Petroleum Industry. An action plan is not required. Delay of test by one month does not significantly impact the results of the project or the project's potential impact on future oil recovery. The second deficiency occurred because the operator did not get complete approval from the EPA. EPA thus shut down the project temporarily. It is expected that the waterflood will be initiated in the first quarter of FY 2004. Once again, no action plan is required as this project is making progress once again.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER5-1e	Analyze results of bench-scale reverse osmosis in produced water treatment equipment. Develop kinetics for model compounds to be used in enzymatic and biomimetic catalysts for upgrading heavy crude oils. Construct greenhouse prototype for phytoremediation for methane (natural gas) from coal bed water. Collect data on fine particulate matter emission factors. Complete prototype methane leak detection refinery test. These studies will provide the scientific basis for lower-cost commercial-scale environmental technologies.	Met 100% of the Target
Commentary –		
<p>WHAT WE DID: Three greenhouses approximately 20 by 40 feet in size were lined and established on an incline to allow CBM water transport in one direction. The first greenhouse evaluated the effect of CBM water uptake into conventional wetland plants (cattails, bulrush, etc.). The second greenhouse evaluated the effect of CBM water uptake on grain crops (barley, corn, maize, sorghum, etc.). The third greenhouse evaluated the effect of CBM water uptake on plants typically used in re-vegetation efforts by the National Resource and Conservation Service. Also in a functioning refinery, the prototype methane leak detection equipment was operated to examine for previously undetected sources of hydrocarbon vapor leaks.</p> <p>SIGNIFICANCE: Work from the first greenhouse showed that plants removed a significant amount of sodium and water quality improved. The second greenhouse results showed that some grain crops grow and produce a satisfactory yield while others die. The third greenhouse established a baseline to existing reclamation efforts so that the other greenhouse experimental results could be extrapolated to a range of field</p>		

conditions. In the refinery test, this leak detection process established that leaks previously undetected under the normal leak detection process were located. This new technology allows operators to reduce costs and air emissions that would not have been otherwise possible. These projects will contribute to the cost savings in the SPSG and the oil and gas resources listed above.

ACTION to CORRECT DEFICIENCY: The bench-scale reverse osmosis results showed that the originally designed process would not work. Alternative methods and materials were considered to show the potential for water clean-up. The materials selected show that it may be possible to treat brackish water (up to 10,000 ppm total dissolved solids - TDS) for beneficial use. Actions are being taken to expand the range of the material to include brines with much higher TDS values. The analytical work is continuing to verify that the new materials selected function with waters that contain organic materials.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Develop two technologies to detect and quantify areas of high fracture density in currently uneconomic low permeability gas reservoirs. Select drill sites for demonstration of the two technologies.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	Demonstrate a cost-effective horizontal well and advanced exploration and stimulation technologies in low permeability natural gas formations for increasing recovery of the 5,000+TCF of gas in place in the Greater Green River and Wind River Basins.	MIXED RESULTS

Annual Target for FY 2003		Assessment
ER5-1f	Conduct four field tests to demonstrate technical feasibility of advanced remote sensing and pipeline inspection technologies to reduce unintentional damage and increase pipeline integrity. Complete two field tests for underground gas storage facilities to improve gas storage well deliverability. Complete field-testing of energy meter prototype.	Met 100% of the Target
<p>Commentary – All planned milestones were met. Two projects, the conformable array and the energy meter module, have gained strong industry support towards commercialization. The field test of the sonic tool has shown promising results and will be tested further, e.g., NICOR Gas has agreed to two additional tests of the sonic tool for scale removal. Analysis of other field test results will determine the overall technical and cost efficiency of the technology and the next step(s) to be taken, i.e., additional modifications or termination.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Complete laboratory testing and begin field demonstrations of an improved remedial technology for storage wells.	MET GOAL
FY 2001	Demonstrate the field application of a shoulder-mounted, portable video methane leak detection system that can be used to significantly reduce costs of leak monitoring at refineries and other facilities while reducing harmful air emissions. Annual savings of \$500,000 per year per refinery, on average, would result from regulatory acceptance and application of this technology.	NOT MET

FY 2000	Complete field-testing and monitoring of two technologies for downhole separation of oil and water, resulting in reduction in produced water and potential increase in oil production per well.	MIXED RESULTS
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Additional Targets from 2002-2000		Assessment
FY 2002	<p>Target: Demonstrate safe economic slimhole drilling technology in actual use under Arctic conditions. This technology can significantly reduce cost and environmental impacts. Result: The demonstration of safe economic slimhole drilling technology in actual use under Arctic conditions was completed during the 3rd quarter of 2002. Under this project, which had the goal of reducing the cost and environmental impact of drilling in the Arctic, four slimhole wells (approximately three inches in diameter) were successfully drilled and completed in the Red Dog Mine area in Alaska. This slimhole system reduced the cost of a typical well by 50% (from two million dollars to one million dollars) and reduced the size of the footprint to one-third that of a typical North Slope drilling system.</p>	MET GOAL
	<p>Target: Complete laboratory testing and begin field demonstrations of an improved remedial technology for storage wells. Result: Laboratory testing was completed. Field demonstration activities were initiated in first quarter 2003. Furness-Newburge, Inc., completed laboratory testing of a sonic tool for scale removal on casing supplied by Southern California Gas and Puget Sound Gas during August 2002. On August 22, 2002, the final field and well site were selected by the project team and NICOR engineers. A field test plan was developed for the data collection, field operations, and data analysis.</p>	MET GOAL
	<p>Plan of Action: The sonic tool will be tested in the Pontiac Gas Storage Field in early November 2002. Efforts to date continue to support the overall goal of reducing the cost of deliverability by ten percent per year.</p>	
	<p>Target: Develop two technologies to detect and quantify areas of high fracture density in currently uneconomic low permeability gas reservoirs. Select drill sites for demonstration of the two technologies. Result: Four technologies/methodologies to detect and quantify areas of high fracture density made significant progress in FY 2002. These technologies are able to detect and quantify high fracture density in currently uneconomic low-permeability gas reservoirs. Progress has buttressed the projection that fracture-detection methodologies can double the average per-well productivity, thus indicating the near-term commercial potential of the technologies. Two technologies were demonstrated and verified through well drilling in FY 2002. These are: 1) The State University of New York at Buffalo completed geological field studies along with geochemical studies of near surface soil gas to detect and quantify anomalous fractured areas in New York State. These initial field data were integrated with subsurface seismic, gravity, and magnetic survey data to locate structural anomalies at the Trenton-Black River Limestone reservoir horizon that were evaluated as drilling targets for gas production. A well was drilled between Seneca and Cayuga Lakes on a graben- horst feature that did not produce economic gas flow, but the drilling did hit a highly fractured dolomitized fault system where it was expected from the integration of the data available.</p>	MET GOAL

2) Lawrence Berkeley National Laboratory led an integrated team that evaluated high-resolution cross-well seismic surveying as a tool to quantify fracture density over a 1000-foot section of a sandstone reservoir in the western San Juan Basin of New Mexico. This investigation involved a collaborative effort with Conoco to evaluate the influence of fracture density and orientation on gas production using an azimuthal seismic survey in the borehole. Conoco drilled a dedicated research well for the cross-well seismic surveys and the results were very positive. The research well is currently producing gas and is one of the most productive wells in the field. The results of the seismic surveys are still being processed, but early results indicate that the azimuthal velocity differences can be used for fracture evaluation.

Well sites have been selected for two other technologies that have been developed. These technologies, which will be field verified in FY 2003, are:

(3) Advanced Resources International continued development of a geomechanical model, which has been proven through well drilling in a development field setting. In a demonstration that focused on exploration, this model was used to help Burlington Resources locate a drill site for an exploration well. Burlington plans to drill the well in FY 2003 without further Government subsidy.

(4) In another exploration-driven demonstration, Geospectrum identified subsurface features associated with gas-filled fractures in the Lower Dakota sandstone in a nine-square-mile area by mapping seismically observed lineament density; seismically inferred gas saturation and clay-vs. -sand percentage; azimuthal differences in interval velocity and acoustic impedance; and an amplitude-vs. -offset anomaly that correlates well with known gas occurrences in wells, and is therefore considered a direct indicator of gas deposits. By overlaying these seismic and geologic attributes with production histories from existing wells, Geospectrum has predicted several optimum sites for new wells. Burlington Resources and DOE's NETL have selected and approved a site for drilling in early 2003. This was a direct application of fracture technology proven over an existing field by Blackhawk in Wyoming.

Target: Demonstrate a small-diameter, lightweight composite drill pipe for ultra-short radius drilling. **Result:** ACPT (Advanced Composite Products and Technology, Inc.), following laboratory commercial testing standards, fabricated several full-size strings of lightweight composite pipe and demonstrated that the composite pipe was commercially viable. The tests were so successful that three commercial companies have agreed to use several sections of the pipe in actual drilling operations in FY 2003. These operators are using this pipe with no subsidy from the Federal Government. The pipe when fully incorporated into the well will reduce the weight of the drill string by 50%. Because the rig can be smaller, this will reduce the cost associated with drilling deeper wells. The day rate for the largest onshore drilling rigs is around \$40,000/day. Smaller rigs cost far less – as much as \$20,000/day less.)

MET GOAL

FY 2001

Completed the demonstration of five advanced secondary and tertiary technologies. Based on models, it is estimated these technologies will increase near-term incremental production by 1.7 million barrels of oil, and long-term incremental production by over 2.4 billion barrels of oil.

NEARLY
MET GOAL

Plan of Action: DOE will continue to pursue the completion of the one

	<p>remaining technology demonstration project. However, its completion is dependent upon the corporate plans and business strategy of the new property owner. The new owner/operator has expressed an interest in continuing work once the sale is completed and will request a modification to the contract with DOE. DOE program managers will work with the new owner/operator of the suspended demonstration project to minimize the delay in the demonstration of the new technology. However, the plan of action is completely dependent upon decisions by the new owner/operator. Successful resumption and completion of this project will allow the goals of this performance measure to be fully met. The new owner/operator has not provided a time frame for negotiating a modified contract.</p>	
	<p>Demonstrated the field application of a shoulder-mounted, portable video methane leak detection system that can be used to significantly reduce costs of leak monitoring at refineries and other facilities while reducing harmful air emissions. Annual savings of \$500,000 per year per refinery, on average, would result from regulatory acceptance and application of this technology.</p> <p>Plan of Action: Complete the refinery test in FY 2002. Analyze results and work with the Environmental Protection Agency and industry to implement this technology as the approved method for leak detection in U.S. refineries.</p>	NEARLY MET GOAL
	<p>Quantified a hydrate deposit by correlating core samples with geophysical and well log data.</p>	MET GOAL
FY 2000	<p>Completed demonstration and transfer of seven advanced secondary and tertiary technologies, adding 92 million barrels of reserves, increasing the number of economic wells and reducing abandonment rates.</p>	MET GOAL
	<p>Completed field-testing and monitoring of two technologies for downhole separation of oil and water, resulting in reduction in produced water and a potential increase in oil production per well.</p>	NEARLY MET GOAL
	<p>Demonstrated a cost-effective horizontal well and advanced exploration and stimulation technologies in low permeability natural gas formations for increasing recovery of the 5,000+ TCF of gas in place in the Greater Green River and Wind River Basins.</p> <p>Plan of Action: A stimulation demonstration will not be pursued at this time.</p>	NEARLY MET GOAL
	<p>Identified a site containing gas hydrates suitable for testing the feasibility of methane recovery.</p>	MET GOAL

Program Goal	Assessment
<p>ER5-2: By 2015, conduct scientific analyses and develop and field test a suite of methane hydrate characterization and diagnostic technologies that will provide a reliable inventory of Alaskan methane hydrate resources and resolve global environmental implications natural methane hydrate instability. By 2008, reduce the cost of producing hydrogen from natural gas by 15 percent.</p> <p>Commentary – Field results from studies and actual samples from a methane hydrate core are providing a wealth of data to the hydrate research community that will advance our understanding of seafloor stability and hydrate production potential. Other noteworthy accomplishments: the first dedicated hydrate well in the U.S. was commenced in March 2003, and 1,400 feet of core was obtained and is being analyzed. Strength and thermal property tests were successfully completed and are providing fundamental data that is needed for modeling production and seafloor stability.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>ER5-2a Exchange information and coordinate effort between government agencies. Award subprojects under Joint Industry Projects (JIP) for Gulf of Mexico seafloor stability and monitoring programs. Issue newsletters, publish available technical reports on the methane hydrate website, and hold two workshops to coordinate program results to researchers. Conduct annual Federal Advisory Committee meeting.</p> <p>Commentary – All planned milestones were met. The interagency meetings, workshops, and Federal Advisory Committee meeting allowed significant coordination and information exchange between all agencies. The web site and newsletter allowed for timely dissemination of pertinent data to industry and researchers in the hydrate community. Subcontracts for the JIP have been awarded on time and will allow this major research effort to be completed as planned.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	Quantify a hydrate deposit by correlating core samples with geophysical and well log data.	MET GOAL
FY 2000	Identify a site containing gas hydrates suitable for testing the feasibility of methane recovery.	MET GOAL

Annual Target for FY 2003	Assessment
<p>ER5-2b Complete hydrate modeling for Alaska drilling program. Report strength and thermal property tests at national labs, this is fundamental data needed to model production and seafloor stability of hydrates. Develop prototype Raman Spectroscopy to use lasers to define hydrate molecular structure.</p> <p>Commentary – All planned milestones were met. The hydrate modeling effort provided guidance for testing procedures for the arctic well. The strength tests and thermal property tests provide fundamental data that is needed for modeling production and seafloor stability. A new prototype spectroscopy tool will help researchers define the hydrate molecular structure.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER5-2c	Complete initial report of improved hydrate coring device on Ocean Drilling Program, Leg 204. Study of oceanic samples is essential to understanding the distribution and properties of hydrate in nature. Drill one test well to determine aerial extent of hydrate occurrence in Alaska. Complete evaluation of hydrate occurrence in Gulf of Mexico to understand the interaction of hydrate and seafloor stability.	Met 100% of the Target
<p>Commentary – All planned milestones were met. Field results are providing a wealth of data to the hydrate research community that will advance our understanding of seafloor stability and production potential. Drilling at the first dedicated hydrate well in the U.S. commenced in March and 1,400 feet of core was obtained and is being analyzed. Field evaluation in the Gulf of Mexico will be used to select the final site for JIP drilling, a major step in understanding seafloor stability issues. The initial report on the deployment of an improved coring device was released.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Program Goal	Assessment
<p>ER6-1: Maintain operational readiness of the Strategic Petroleum Reserve (SPR) to drawdown at a sustained rate of 4.4 million barrels per day for 90 days, within 15 days notice by the President, and fill the SPR to its current capacity of 700 million barrels by 2005.</p> <p>Commentary – No commentary provided.</p>	<p>Met at or above 80%, but below 100%, of the Goal</p>

Annual Target for FY 2003	Assessment
<p>ER6-1b Add 39.8 million barrels (cumulative from April 2002). EOY crude oil inventory will equal 628 million barrels.</p> <p>Commentary – The crude oil inventory of the SPR at the end of September was 624.4 MMB, versus our target of 628 MMB. The variance was caused by deferral of nearly 20 MMB in oil receipts during the Venezuela oil crisis. For this deferral, we will receive an additional 2.9MMB premium.</p>	<p>Met at or above 80%, but below 100%, of the Target</p>

Related Annual Targets (FY 2002 – FY 2000)	Assessment
<p>FY 2002 Target: Continue the delivery of exchanged Federal Royalty Oil to the SPR that was transferred to DOE in FY 1999-2001, per the FY 1999 Agreement with the Department of Interior. Approximately 11 million barrels will be added to SPR inventory in FY 2002. Result: Delivery to the SPR of exchanged Federal Royalty Oil was continued, per the FY 1999 Agreement with the Department of the Interior. In FY 2002, this effort added approximately 9.4 million barrels to SPR inventory, and contributed toward the total delivery to inventory of 42.5 million barrels during the fiscal year, from all exchange and Federal Royalty Oil agreements.</p> <p>Target: Commence the transfer of Federal Royalty Oil under Phase III to the SPR in April 2002. By the end of FY 2002, add 9.2 million barrels of royalty oil to the SPR inventory. Result: Transfer of Federal Royalty Oil to the SPR under Phase III commenced in April 2002. In FY 2002, approximately 10.2 million barrels of royalty oil from Phase III were added to the SPR inventory, exceeding the projected target for this effort.</p> <p>Plan of Action: Additional contracts are planned for award for FY 2003 delivery and beyond as the mechanism for filling the SPR to capacity.</p>	<p>MET GOAL</p> <p>MET GOAL</p>
<p>FY 2001 Established a Northeast Heating Oil Reserve of up to two million barrels.</p>	<p>MET GOAL</p>

	Completed the transfer of Federal Royalty Oil to the SPR by November 2000, per the FY 1999 Agreement with the Department of Interior.	MET GOAL
FY 2000	Completed contracting for the transfer and/or exchange of 28 million barrels of Federal Royalty Oil from the Department of the Interior for a net increase of approximately 23 million barrels in the SPR inventory, with deliveries of a remaining four million barrels in FY 2001.	MET GOAL

Annual Target for FY 2003		Assessment
ER6-1c	Complete the Degas Plant design.	Met 100% of the Target
Commentary – No commentary provided.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Award the contract for degas plant construction by November 30, 2001. A degas plant is a vapor pressure system for the continuous removal of excess gas from the SPR crude oil inventory.</p> <p>Result: Completed the annual target with the award on November 29, 2001, of the firm fixed-price turnkey (design/build) contract to Petrofac LLC of Tyler, Texas, to provide a portable degas plant for continuous removal of excess gas from the SPR crude oil inventory.</p> <p>Plan of Action: Project is on schedule with additional milestones scheduled in future fiscal years.</p>	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from FY 2000		Assessment
FY 2000	Completed the Life Extension Program to ensure the long-term reliability, effectiveness, and operational readiness of SPR facilities and systems.	MET GOAL

Program Goal	Assessment
<p>ER7-1: Deploy new nuclear generation to meet energy and climate goals by enabling an industry decision to deploy at least one new advanced nuclear power plant in the U.S. by 2010 to support the President's goal of reducing greenhouse gas intensity by 18 percent by 2012; completing design of an economic, commercial-scale hydrogen production system using nuclear energy by 2015; and developing a next-generation nuclear system for deployment after 2010 but before 2030 that provides significant improvements in proliferation and terrorism resistance, sustainability, safety and reliability, and economics.</p>	<p>Met at or above 80%, but below 100%, of the Goal</p>
<p>Commentary – Submittal of the two Early Site Permit applications to the NRC is a major step toward demonstration of new and otherwise untested NRC regulations. The untested NRC licensing processes have been identified by the nuclear industry as some of the major impediments to deployment of new nuclear power plants in the U.S. Award of at least one industry cost-shared cooperative agreement has been delayed into FY 2004 pending the outcome of the Energy legislation currently under consideration in Congress. The outcome of this legislation could impact the work scope of the pending solicitation. In addition, potential nuclear industry respondents to the solicitation are awaiting the outcome of the Energy legislation before preparing proposals for submittal to the Department. The issuance of the Generation IV Technology Roadmap represents the work of over 100 international industry and scientific experts reviewing and assessing over 100 nuclear reactor designs. This document provides the basis for moving forward to meet the goal of developing a next-generation nuclear system. Preliminary functional requirements for the Very-High Temperature Reactor have been established and documented in the report Next Generation Nuclear Plant - High Level Functions and Requirements. This report establishes the high level requirements that will provide a critical input for meeting the goal of completing design of an economic, commercial-scale hydrogen production system using nuclear energy and developing a next-generation nuclear system.</p>	

Annual Target for FY 2003		Assessment
ER7-1a	Under the cooperative agreements with U.S. power generation companies, support the preparation and submittal of at least two Early Site Permit applications for commercial sites to NRC.	Met 100% of the Target
<p>Commentary – Two utilities have completed and submitted their Early Site Permit (ESP) applications to the Nuclear Regulatory Commission (NRC) in spite of difficulties with new seismic qualification requirements. In addition, the third utility submitted its ESP application to the NRC on October 21, 2003. Submittal of the ESP applications to the NRC is a major step toward demonstration of new and otherwise untested NRC regulations. The untested NRC licensing processes have been identified by the nuclear industry as some of the major impediments to deployment of new nuclear power plants in the U.S. Successful demonstration of the ESP process supports the Department's Program Strategic Performance Goal ER7-1. The 4th quarter target was not stated correctly - the intent was to commit to the submission of two ESP applications consistent with the annual performance target and acknowledge that the potential for a third ESP application existed. Nevertheless, the annual target of two ESP applications was achieved.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Complete at least two cooperative agreements with U.S. power generating companies to jointly proceed with at least two NRC Early Site Permit (ESP) applications for specific DOE and/or commercial sites. Result: Early Site Permit Scoping Study award selections were announced February 2002. Two ESP Scoping Study</p>	MET GOAL

	cooperative agreements were finalized and issued on April 15, 2002, with Dominion Energy Inc. and on May 3, 2002, for Exelon Company LLC. Final scoping study project reports were issued in September 2002. An ESP Demonstration solicitation was issued and proposals were received on April 15, 2002. Award selections were made June 3, 2002. Three cooperative agreements with Dominion Energy Inc., Exelon Company LLC, and Entergy Nuclear Potomac Company were completed September 2002.	
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER7-1b	Following a competitive process, award at least one industry cost-shared cooperative agreement for technology development and regulatory demonstration activities.	Met less than 80% of the Target
<p>Commentary – Neither the 4th quarter target nor the annual performance target were achieved. Achievement of these targets and the associated procurement activities have been delayed into FY 2004 pending the outcome of the Energy legislation currently under consideration in Congress. The outcome of this legislation could impact the work scope of the pending solicitation. In addition, potential nuclear industry respondents to the solicitation are awaiting the outcome of the Energy legislation before preparing proposals for submittal to the Department.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Develop and sign an agreement with U.S. industry and our international partners to begin a gas reactor fuel-testing program that will enable licensing of gas-cooled reactors in the United States.</p> <p>Result: Existing agreements established between NE, General Atomics, and the European Commission’s High Temperature Reactor Technology Network are being used by the Department to sponsor a multi-year gas reactor fuel irradiation test program at the High Flux Reactor in Petten, the Netherlands. The results from the test program will support the licensing of advanced gas-cooled reactors in the United States, which are identified as a candidate for deployment in the Nuclear Energy Research Advisory Committee Report, “A Roadmap to Deploy New Nuclear Power Plants in the United States by 2010.” INEEL and ORNL, in conjunction with industry, NRC and DOE, developed and issued a program plan for the development and qualification of advanced gas reactor fuels in the United States in September 2002.</p>	Met Goal
	<p>Target: Complete and issue the government/industry roadmap to build new nuclear plants in the United States by 2010. Result: On</p>	Met Goal

	October 31, 2001, a Near-Term Deployment Working Group, operating under the direction of the Department's Nuclear Energy Research Advisory Committee, completed and issued "A Roadmap to Deploy New Nuclear Power Plants in the United States by 2010" which recommends actions to be taken by industry and the Department to support deployment of new advanced nuclear power plants in the United States by 2010.	
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER7-1c	Issue the Generation IV Technology Roadmap to develop the most promising next generation nuclear energy system concepts.	Met 100% of the Target
<p>Commentary – The Generation IV Technology Roadmap was submitted to Congress on April 30, 2003. The issuance of the Generation IV Technology Roadmap represents the work of over 100 international industry and scientific experts reviewing and assessing over 100 nuclear reactor designs. This document provides the basis for moving forward to meet the goals of developing a next-generation nuclear system as described in the Department's Program Strategic Performance Goal ER7-1.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Complete the draft Generation IV Technology Roadmap for development of the next generation nuclear energy systems. Result: The draft Generation IV Technology Roadmap for development of next generation nuclear energy systems was completed. On September 30, 2002, the Nuclear Energy Research Advisory Committee agreed that the roadmap was an initial foundation for the U.S. program.	MET GOAL
FY 2001	Formally established the Generation IV International Forum to assist in identifying and conducting cooperative R&D. Initiated development of a Generation IV Technology Roadmap for development of next generation nuclear energy systems.	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER7-1d	Develop preliminary functional requirements for the Generation IV Very-High-Temperature Reactor.	Met 100% of the Target
<p>Commentary - Preliminary functional requirements for the Very-High Temperature Reactor have been established and documented in the report, "Next Generation Nuclear Plant - High Level Functions and Requirements." This report was prepared by the Idaho National Laboratory and provided to DOE on September 25, 2003. This report establishes the high level requirements that will provide critical input for meeting the Department's Program Strategic Performance Goal ER7-1 of "completing design of an economic, commercial-scale hydrogen production system using nuclear energy by 2015; and developing a next-generation nuclear system for deployment after 2010 but before 2030 that provides significant improvements in proliferation and terrorism resistance, sustainability, safety and reliability, and economics."</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Program Goal	Assessment
<p>ER7-2: Maximize energy from nuclear fuel by enabling a decision by 2010 to forgo the technical need for a second repository while still supporting expanded nuclear power in the U.S. and develop the technology to reduce commercial high-level waste by a factor of four by 2015; and commercializing technology to reduce long-term radiotoxicity and heat load of spent fuel by 2030.</p> <p>Commentary – Establishment of the functions and requirements in the Advanced Fuel Cycle Initiative fuel irradiation implementation plan is a critical part of supporting this goal, because the irradiations to be performed under the plan, when completed, will add critical information needed to justify ultimate testing of fuels containing plutonium, neptunium, and possibly americium, in power producing reactors, all of which can extend the net energy available from the natural resource. The test articles fabricated at Los Alamos National Laboratory will be used in the Light Water Reactor series of irradiations which, when completed and analyzed, will support this goal by using material that would otherwise be waste to produce energy when recycled in reactors as mixed oxide fuel. Two laboratory scale demonstrations of the extraction of plutonium and neptunium from spent nuclear fuel were successfully completed and the results have demonstrated that the basic experimental flow-sheets are sound.</p>	Met 100% of the Goal

Annual Target for FY 2003		Assessment
ER7-2a	Complete fabrication of test articles containing proliferation-resistant transmutation fuels for irradiation in the ATR beginning in FY 2004.	Met 100% of the Target
<p>Commentary - Functions and requirements for the intermediate-term (Series-One) fuel were submitted as part of the Advanced Fuel Cycle Initiative fuel irradiation implementation plan, approved at the August 26, 2003 Fuels Working Group meeting. Implementation of the functions and requirements in this document is a critical part of supporting the Department's Program Strategic Performance Goal ER7-2 of maximizing energy from nuclear fuel. The irradiations to be performed under the plan will add critical information needed to justify ultimate testing of fuels containing plutonium, neptunium, and possibly americium, in power producing reactors, all of which can extend the net energy available from the natural resource. Fabrication of intermediate-term oriented test articles (transuranic-bearing oxide pellets) for the Light Water Reactor (LWR-1) test was completed at Los Alamos National Laboratory in September 2003, in preparation for an FY 2004 irradiation in the Advanced Test Reactor (ATR). The ATR was shut down in August for unrelated safety reasons and is not expected to restart until November 2003. Shipment of test articles to INL will occur in FY 2004 for irradiation in the ATR. The shipment was postponed due to the shutdown and will not impact the irradiation process. The test articles will be used in the Light Water Reactor series of irradiations which, when completed and analyzed, will support the Department's Program Strategic Performance Goal ER7-2 of developing the technology to maximize energy from nuclear fuel by using material that would otherwise be waste to produce energy when recycled in reactors as mixed oxide fuel.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Successfully manufacture advanced transmutation non-fertile fuels and testing containers for irradiation testing in the Advanced Test Reactor. Result: Several advanced transmutation non-fertile fuel specimens have been fabricated, and testing containers have been constructed. Irradiation testing is a key activity in the development of proliferation-resistant fuels for advanced fast reactors.</p> <p>Target: Complete a report to Congress comparing chemical processing, and pyroprocessing, accelerator-driven, and fast reactor alternatives for transmutation, proliferation resistance, and life cycle cost estimates. Result: The “Report to Congress on Advanced Fuel Cycle Initiative: The Forward Path for Advanced Spent Fuel Treatment and Transmutation Research” was completed and is awaiting Office of Management and Budget concurrence.</p> <p>Plan of Action: The Office of Management and Budget is expected to send the report to Congress.</p>	<p>MET GOAL</p> <p>MIXED RESULTS</p>
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER7-2b	Demonstrate a laboratory scale extraction of plutonium and neptunium as well as cesium and strontium from other actinides and fission products to support the development of advanced fuel cycles for enhanced repository performance.	Met 100% of the Target
<p>Commentary – Two laboratory scale demonstrations of the extraction of plutonium and neptunium from spent nuclear fuel were successfully completed during July and early August at ORNL. Additional hot tests were completed during the fourth quarter at both ORNL and ANL. These separations results have demonstrated that the basic experimental flowsheets are sound, and have contributed to meeting the Department's Program Strategic Performance Goal ER7-2 of developing technologies to reduce high-level waste by 2015, and long-term radiotoxicity and heat load by 2030.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Demonstrate the separation of highly radioactive isotopes from civilian spent nuclear fuel from uranium with the uranium cleaned up to 99.999% pure (Class C waste), using the newly developed UREX process. Result: The hot UREX demonstration of separating highly radioactive isotopes from civilian spent fuel at the Savannah River Technology Center was conducted. The demonstration separated uranium from the highly radioactive isotopes in the spent nuclear fuel. Initial analyses indicate 99.999% purity was achieved.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Additional Targets from 2002-2001		Assessment
FY 2002	Target: Following completion of primary sodium drain, complete deactivation of Experimental Breeder Reactor II (EBR-II) and all directly related surplus facilities by March 2002. Result: The EBR-II in Idaho was deactivated and officially closed on March 25, 2002, thus completing a major Departmental effort that began in 1994 with a Congressional decision to terminate the Integral Fast Reactor Program and shut down EBR-II. Closure activities included defueling the reactor, draining and processing the sodium coolant, placing the sodium-bonded spent nuclear fuel in storage until it can be treated, and placing the reactor and non-reactor systems in an industrially and radiologically safe condition.)	MET GOAL
	Target: Treat a minimum of 0.5 MTHM of EBR-II spent nuclear fuel. Result: A total of 0.6 metric tons of heavy metal (MTHM) of EBR-II spent nuclear fuel were treated, which exceeded the 0.5 MTHM target. Pyroprocessing of EBR-II spent nuclear fuel is a critical component of understanding how to reduce the toxicity of spent nuclear fuel for fast reactors.	MET GOAL

FY 2001	Established a new Advanced Accelerator Applications university fellowship program, and funded ten new graduate students in engineering and science.	MET GOAL
	<p>Supported U.S. universities' nuclear energy research and education capabilities by:</p> <ul style="list-style-type: none"> • Providing fresh fuel to all university reactors requiring this service; • Funding at least 23 universities with research reactors for reactor upgrades and improvements; • Partnering with private companies to fund 18 or more DOE/Industry Matching Grants Program for universities; and • Continued to support Reactor Sharing enabling each of the 29 schools eligible for the program to improve the use of their reactors for teaching, training, and education within the surrounding community. • Attracted outstanding U.S. students to pursue nuclear engineering degrees by: <ul style="list-style-type: none"> -Providing 24 fellowships; -Increasing the number of Nuclear Engineering Education Research Grants to approximately 50 existing and new grants; and -Providing scholarships to approximately 50 sophomore, junior, and senior nuclear engineering and science scholarship recipients, including the partnering of minority institutions with nuclear engineering schools to allow these students to achieve a degree in their chosen course of study and nuclear engineering. 	
FY2000	Completed Fuel Conditioning Facility maintenance and resumed sodium-bonded fuel treatment activities.	MET GOAL

Program Goal	Assessment
<p>ER7-3: Protect existing nuclear generation to support the <i>National Energy Policy</i> objective to maintain and expand the Nation's electricity generation infrastructure by sponsoring innovative, investigator-initiated R&D to enhance the performance of light-water reactor technology to increase generating output from existing plants by at least an additional 500 megawatts by 2020.</p>	Met 100% of the Goal
<p>Commentary – The innovative, investigator-initiated R&D completed in 29 NERI projects contributes to meeting this goal by advancing technology in the areas of advanced reactors (12 projects), advanced reactor fuel (nine projects), fundamental nuclear science and technology (seven projects), and nuclear waste management (one project). The award of the five new I-NERI projects with the Republic of Korea provides for cost-shared R&D collaboration that will enhance power plants reliability and safety, while providing for new innovative designs that will offer significant cost reductions for construction, maintenance and operation. These projects cover technologies that support the National Energy Policy and the Department's new Strategic Plan Energy Security goal, and will improve upon existing light-water reactor technology.</p>	

Annual Target for FY 2003		Assessment
ER7-3a	Complete 29 Nuclear Energy Research Initiative (NERI) projects initiated in FY 1999 and FY 2000 in the areas of advanced reactor technology, advanced reactor fuel, fundamental nuclear science technology, and/or nuclear waste management.	Met 100% of the Target
<p>Commentary – An additional nine NERI projects were completed in the 4th quarter, bringing the total number of projects completed in FY 2003 to 29. The innovative, investigator-initiated R&D completed in these projects contributes to meeting the Department's long term Program Strategic Performance Goal ER7-3 by advancing technology in the areas of advanced reactors (12 projects), advanced reactor fuel (nine projects), fundamental nuclear science and technology (seven projects), and nuclear waste management (one project).</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Completed the first 3-year phase of NERI research and development.	MET GOAL
	Complete funding for the 10 NERI projects initiated in FY 2000; provide funding for the second year of the 13 NERI projects initiated in FY 2001; and, award at least 16 new NERI projects.	MET GOAL
FY 2001	Completed funding for the first 3-year phase of Nuclear Energy Research Initiative (NERI) research and development; select feasible and important reactor and fuel cycle concepts for continued development; and, issue approximately 15 new awards.	MET GOAL
	Completed four projects, continued 10 projects initiated in FY 2000, and initiated eight new projects to conduct R&D activities associated with managing long-term effects of plant aging and improving electricity generation.	MET GOAL
FY 2000	Continue Nuclear Energy Research Initiative (NERI) research to improve the understanding of new reactor and fuel cycle concepts and nuclear waste management technologies, and begin to develop a preliminary feasibility assessment of the concepts and technologies.	MET GOAL
	Issued the first update to the Joint DOE/EPRI Strategic Research and Development Plan to Optimize U.S. Nuclear Power Plants.	MET GOAL
	Implemented a cooperative cost-shared R&D program by working with industry, universities, national laboratories, and the Nuclear Regulatory Commission to address technical issues that could impact continued operation of current nuclear power plants.	MET GOAL

Annual Target for FY 2003		Assessment
ER7-3b	Award five new International NERI (I-NERI) projects in the areas of next generation reactor and fuel cycle technology, innovative nuclear plant design and advanced nuclear fuels and materials with the Republic of Korea.	Met 100% of the Target
<p>Commentary – The award of the five new I-NERI projects with the Republic of Korea provides for cost-shared R&D collaboration that will enhance power plants reliability and safety, while providing for new innovative designs that will offer significant cost reductions for construction, maintenance and operation. These projects cover technologies that support the National Energy Policy and will improve upon existing light-water reactor technology.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Complete five projects initiated in prior years associated with managing long-term effects of plant aging and improving electricity generation. Result: Completed five prior year projects associated with managing the long-term effects of plant aging and improving electricity generation.</p> <p>Award at least six International NERI bilateral cost-shared research projects with three countries.</p>	MET GOAL
FY 2001	Establish bilateral research programs with other countries to improve the cost, and enhance the safety, non-proliferation, and waste management capabilities of future nuclear energy systems.	MET GOAL
FY 2000	There were no related Targets for FY 2000.	N/A

Program Goal	Assessment
<p>ER7-4: Maintain and enhance national nuclear capabilities by producing highly-trained nuclear scientists and engineers to meet the Nation’s energy, environmental, health care, and national security needs; preserving critical user facilities in a safe, secure, environmentally-compliant, and cost-effective manner to support national priorities; replenishing Federal technical and management staff with emphasis on obtaining high-caliber junior professionals with diverse backgrounds; and delivering isotope products and services for commercial, medical, and research applications where there is no private sector capability or sufficient capacity does not exist to meet United States needs such that by December 2004, deliveries continue to be made to customers as needed.</p> <p>Commentary – The issuance of funding for reactor sharing, award of research and educational grants, continuation of support for four Innovations in Nuclear Infrastructure and Education (INIE) grants, and the award of two additional INIE grants enabled universities to maintain support of operations and retain their physical infrastructure to educate and train the next generation of nuclear scientists and engineers. Isotope Production Facility construction activities were completed and commissioning activities will begin in November 2003. Meeting this milestone completes the turnaround of a project that had been troubled in its early stages and demonstrates Nuclear Energy's ability to effectively manage projects to a successful completion within realistic cost and schedule parameters. The Phase 3 scope for the Test Reactor Area Electrical Utility Upgrade project is being</p>	Met at or above 80%, but below 100%, of the Goal

eliminated since it involves upgrades to a building now planned for demolition under the new Idaho National Laboratory Ten-Year Comprehensive Site Plan. This decision was made for both safety and efficiency reasons. The High Flux Isotope Reactor was determined to be unable to operate within its safety envelope during its January 2003 outage and NE exercised its authority to delay startup until satisfied that the reactor's problems were solved. NE was very proactive in expediting remedial actions and fully engaged senior Oak Ridge Site Office and UT-Battelle management. As a result, UT-Battelle executed an extensive corrective action plan and replaced several key HFIR managers. UT-Battelle management initiatives will continue into 2004. Fabrication of eight iridium clad vent sets was completed at Oak Ridge National Laboratory and 2.9 kilograms of scrap Pu-238 were processed at Los Alamos National Laboratory, thus demonstrating the operational capability of the radioisotope power systems infrastructure. The Idaho Integrated Safeguards and Security Plan to assure appropriate protective measures are taken commensurate with the risks and consequences has been completed, and NE directed its implementation through the award of a new management contract which merges Idaho National Laboratory with Argonne National Laboratory-Idaho. A draft statement of work has been prepared and award of the contract is expected by March 31, 2004.

Annual Target for FY 2003		Assessment
ER7-4a	Protect national nuclear research assets by funding four regional reactor centers; providing fuel to University Research Reactors; funding 20 to 25 DOE/Industry Matching Grants, 18 equipment and instrumentation upgrades, and 37 Nuclear Engineering Education Research grants; and providing 18 fellowships and 40 scholarships.	Met 100% of the Target
<p>Commentary – The successful completion of both the quarterly measures and annual target permitted the program to meet that portion of the Department's Program Strategic Performance Goal ER7-4 pertaining to the production of highly trained nuclear scientists and engineers, the preservation of critical user facilities and attracting a diverse group of technical staff. The issuance of funding for reactor sharing, award of research and educational grants, continuation of support for four Innovations in Nuclear Infrastructure and Education (INIE) grants, and the award of two additional INIE grants enabled universities to maintain support of operations and retain their physical infrastructure to educate and train the next generation of nuclear scientists and engineers.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Attract outstanding U.S. students to pursue nuclear engineering degrees by:</p> <ul style="list-style-type: none"> • Providing 18 graduate student fellowships with higher stipends beginning in FY 2002; • Supporting 50 university Nuclear Engineering Education Research Grants to encourage creative and innovative research at U.S. universities; and • Providing scholarships and summer on-the-job training to approximately 40 sophomore, junior, and senior nuclear engineering and science scholarship recipients. <p>Result: Outstanding students were attracted to pursue nuclear engineering degrees by taking the following actions:</p> <ul style="list-style-type: none"> • A total of 18 graduate student fellowships were awarded; • A total of 50 Nuclear Engineering Education Research Grants were supported; i.e. 20 new grants were awarded to 20 universities in May 2002 and funding was provided to continue 30 grants awarded in 	MET GOAL

previous years; and

- 50 scholarship awards and summer on-the-job training opportunities were provided to sophomore, junior and senior nuclear engineering and science recipients in May 2002.

Target: Support U.S. universities' nuclear energy research and education capabilities by:

MET GOAL

- Providing fresh fuel to university reactors requiring this service;
- Funding all of the 23 universities with research reactors that apply for reactor upgrades and improvements;
- Partnering with private companies to fund 20 to 25 DOE/Industry Matching Grants for universities;
- Providing funding for Reactor Sharing with the goal of enabling all of the 28 eligible schools that apply for the program to improve the use of their reactors for teaching, training, and education; and
- Awarding two or more Innovations in Nuclear Infrastructure and Education awards.

Result: U.S. universities' nuclear energy research and education capabilities geared to foster increased enrollments were supported as shown below:

Fresh fuel was provided to all university reactors that required this service as follows:

- Missouri in February 2002;
- MIT and Missouri in April 2002;
- Additional fresh fuel shipments are planned to Missouri in August and MIT in September;
- Spent fuel shipments are planned for Missouri in August, and MIT and Michigan in September;
- 23 university reactor upgrade grants were announced June 10, 2002;
- 21 DOE/Industry Matching Grants/Awards for universities were announced June 10, 2002;
- Of the 28 eligible schools, Reactor Sharing award selections were made to the 21 who applied and were announced June 10, 2002; and
- Four Innovations in Nuclear Infrastructure and Education awards were announced June 10, 2002 to help increase the use of university research reactors.

FY 2000

(1) Attracted outstanding U.S. students to pursue nuclear engineering degrees by:

EXCEEDED GOAL

- Providing 18-20 fellowships;
- Increasing the number of Nuclear Engineering Education Grants to 45 existing and new grants; and
- Providing scholarships and summer on-the-job training to approximately 50 sophomore, junior and senior nuclear engineering and science scholarship recipients.

(2) Supported U.S. universities' nuclear energy research and education capabilities by:

- Providing fresh fuel to all university reactors requiring this service;
- Providing funding for reactor upgrades and improvements at least 23

universities;

- Partnering with 17 or more private companies to fund DOE/Industry Matching Grants Programs for universities; and
- Increasing the funding for Reactor Sharing by 20% over FY 1998, enabling each of the 29 schools eligible for the program to improve the use of their reactors for teaching, training, and education within the surrounding community.

Annual Target for FY 2003		Assessment
ER7-4b	Keep cost and schedule milestones for upgrades and construction of key nuclear facilities within 10 percent of approved baselines.	Met at or above 80%, but below 100%, of the Target
<p>Commentary – Construction activities, including all necessary readiness reviews, were completed and a request for approval of Critical Decision 4 - Approve Start of Operations, was submitted as scheduled on September 29, 2003 for the Isotope Production Facility. This completes the final schedule milestone for FY 2003, all of which were completed on schedule. While the final budget numbers have not been compiled, the project should be completed at or slightly below cost. Commissioning activities will begin in November 2003, following the November maintenance outage of the LANSCE accelerator. Meeting this milestone completes the turnaround of a project that had been troubled in its early stages and demonstrates Nuclear Energy's ability to effectively manage projects to a successful completion within realistic cost and schedule parameters. The fourth quarter target was not achieved for the Test Reactor Area Electrical Utility Upgrade project. The Phase 3 scope is being eliminated since it involves upgrades to a building now planned for demolition under the new Idaho National Laboratory Ten-Year Comprehensive Site Plan. This decision was made for both safety and efficiency reasons. The change in work scope will be reflected in a Baseline Change Proposal currently due into NE Headquarters by December 12, 2003. This target also meets the Department's Program Strategic Performance Goal ER7-4 of maintaining and enhancing national nuclear capabilities by preserving critical user facilities in a safe, secure, environmentally-compliant, and cost-effective manner to support national priorities.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Completed 80% of the construction of the Los Alamos Isotope Production Facility, which is needed for the production of short-lived radioisotopes essential for U.S. medical.	MET GOAL
FY 2001	Completed 75% of the facility construction and equipment installation for the new 100 MeV Isotope Production Facility, which is needed to continue production of short-lived radioisotopes essential for U.S. medical research.	MET GOAL
FY 2000	Completed at least 40% of the construction of the Los Alamos Isotope Production Facility, which is needed for the production of short-lived isotopes for medical research.	MET GOAL

Annual Target for FY 2003		Assessment
ER7-4c	Safely operate each key nuclear facility within 10 percent of the approved plan, shutting down reactors if they are not operated within their safety envelope and expediting remedial action.	Met 100% of the Target
<p>Commentary – The comprehensive peer review plan has been developed in cooperation with the Office of Science and distributed to the peer reviewers in August 2003, thus meeting the 4th quarter target. The target for FY 2003 has been met. The HFIR was determined to be unable to operate within its safety envelope during its January 2003 outage and NE exercised its authority to delay startup until satisfied that the reactor's problems were solved. NE was very proactive in expediting remedial actions. NE fully engaged senior Oak Ridge Site Office and UT-Battelle management. As a result, UT-Battelle executed an extensive corrective action plan and replaced several key HFIR managers. UT-Battelle management initiatives will continue into 2004. This also meets the Department's Program Strategic Performance Goal ER7-4 of maintaining and enhancing national nuclear capabilities by preserving critical user facilities in a safe, secure, environmentally-compliant, and cost-effective manner to support national priorities.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	Maintained the FFTF in a safe, environmentally compliant standby condition while implementing a Secretarial decision to conduct a National Environmental Policy Act (NEPA) review of the environmental impacts of enhancing the Department's nuclear research facility infrastructure.	MET GOAL
		MET GOAL

Annual Target for FY 2003		Assessment
ER7-4d	Demonstrate the operational capability of radioisotope power systems infrastructure by fabricating flight quality products at each of the major facilities (i.e., at least eight iridium clad vent sets at ORNL and at least eight encapsulated Pu-238 fuel pellets at LANL), and by processing at least two kilograms of scrap Pu-238 at LANL.	Met 100% of the Target
<p>Commentary – The fabrication of the two remaining iridium clad vent sets was completed at the Oak Ridge National Laboratory, meeting the fourth quarter target and bringing the total for the year to eight iridium clad vent sets. This accomplishment meets the FY 2003 performance target and the part of the Department's Program Strategic Performance Goal ER7-4 of maintaining and enhancing the national nuclear capability by preserving critical user facilities to support national priorities. During the fourth quarter an additional 0.7 kilograms of scrap Pu-238 were processed at the Los Alamos National Laboratory, bringing the total for the year to 2.9 kilograms. Also, LANL completed the encapsulation of eight fuel pellets. These accomplishments meet the FY 2003 4th quarter target, the FY 2003 performance target and the part of the Department's Program Strategic Performance Goal ER7-4 related to maintaining and enhancing the national nuclear capability by preserving critical user facilities to support national priorities.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Bring the full-scale scrap recovery line to full operation and begin processing Pu-238 scrap for reuse in ongoing and future missions requiring use of radioisotope power systems. Result: The full-scale scrap recovery line was on schedule to be brought to full operation and begin processing Pu-238 by the end of the fiscal year. In April 2002, the Defense Nuclear Facilities Safety Board (DNFSB) raised concerns about the authorization basis that the Department was unable to resolve prior to the end of the fiscal year. Resolution of their concerns will require modifications to some equipment and changes in the safety characterization of some equipment. Making these changes will extend the startup date to the end of the second quarter of FY 2003. Plan of Action: NNSA has established a response to each of the DNFSB concerns. The responses involve changes to the equipment or safety basis. Once consensus is reached with the DNFSB on the responses, the Department will move forward to complete the required actions to allow the scrap recovery line to be brought to full operation by the end of the second quarter of FY 2003.</p> <p>Target: Demonstrate the operational capability of radioisotope power systems infrastructure by fabricating quality products at each of the major facilities (i.e., at least eight iridium clad vent sets at ORNL and at least eight encapsulated Pu-238 fuel pellets at LANL). Result: Flight quality products at ORNL and LANL demonstrated the operational status of these facilities. Eight iridium clad vent sets were produced at ORNL and eight encapsulated pellets were fabricated at LANL.</p>	MIXED RESULTS
FY 2001	Completed installation of the full scale Pu-238 scrap recovery line to process Pu-238 scrap that will be required to provide radioisotope power systems for planned NASA and national security missions.	MET GOAL
FY 2000	Completed bench scale demonstration of the process to recover Pu-238 scrap for reuse in power systems for future missions using radioisotope power systems.	MET GOAL

Annual Target for FY 2003		Assessment
ER7-4e	Complete the Idaho Integrated Safeguards and Security Plan to assure appropriate protective measures are taken commensurate with the risks and consequences for both laboratories on the Idaho site.	Met 100% of the Target
<p>Commentary – The Idaho Integrated Safeguards and Security Plan has been completed and NE directed its implementation through the award of a new management contract which merges the Idaho National Laboratory with Argonne National Laboratory-Idaho. A draft statement of work has been prepared and award of the contract is expected by March 31, 2004.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	During FY 2002, no national security incidents occurred within NE Idaho site wide cyber systems and security areas that caused unacceptable risk or damage to the Department.	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Program Goal	Assessment
ER8-1: Provide national and international energy data, analyses, information, and forecasts to meet the needs of energy decision-makers and the public in order to promote sound policymaking, efficient energy markets, and public understanding.	Met 100% of the Goal
Commentary – No commentary provided	

Annual Target for FY 2003	Assessment
ER8-1a Conduct informational briefings for high-level energy policymakers in the Administration and Congress to provide timely information and analyses on topical energy issues and situations.	Met 100% of the Target
Commentary – This target was met. By counting the number of briefings and reports, EIA is assessing our impact on Congress and other policy makers. Although EIA does do customer satisfaction surveys of its general customer base, we have never submitted customer opinion surveys to members of Congress. Our measure of satisfaction for Congress is that we are continually invited back to testify and that specific service reports are requested.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Maintain and improve web-based networks for the Energy Resources organizations to ensure wide distribution of information about Energy Resources programs, such that the average number of unique monthly users of Energy Resources Websites will continue to grow at least 20 percent per year through 2005 (from a baseline of about 71,000 per month in 1997).	MET GOAL
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Annual Target for FY 2003		Assessment
ER8-1b	Increase the number of unique monthly users of Energy Information Administration's (EIAs) Website by at least 20 percent per year through 2005 (from a baseline of about 71,000 per month in 1997).	Met 100% of the Target
<p>Commentary – This target was exceeded. EIA's website is our primary means of disseminating detailed data and analysis, and users constitute a wide range of both energy industry experts and the general public. Although this is largely driven by external events, EIA closely monitors any declines in the number of users as an indicator of possible problems.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain and improve web-based networks for the Energy Resources organizations to ensure wide distribution of information about Energy Resources programs, such that the average number of unique monthly users of Energy Resources Websites will continue to grow at least 20% per year through 2005 (from a baseline of about 71,000 per month in 1997). Result: EIA had an increase of over 2.3 million unique monthly users of EIA's website for the fiscal year. This growth exceeds the expected target growth rate.	MET GOAL
FY 2001	Achieved a growth rate of at least 20% per year in the average number of unique monthly users of EIA's website (from about 71,000 per month in 1997). For FY 2001, monthly Internet user sessions averaged in excess of 602,500 which represent an 87.0% increase from FY 2000.	MET GOAL
FY 2000	Achieved a growth rate of at least 20% per year in the average number of unique monthly users of EIA's website (from about 71,000 per month in 1997). During FY 2000, EIA averaged over 322,100 unique monthly users of its website, an increase of over 110% from the previous year.	MET GOAL

Annual Target for FY 2003		Assessment
ER8-1c	Increase the number of citations of EIA in major media outlets by at least 10 percent per year through 2005 (from a baseline of 73 citations in major media outlets in 1999).	Met 100% of the Target
<p>Commentary – This target was exceeded. The coverage of EIA in the five largest newspapers is a measure of EIA as "wholesale" provider of information. Although this is largely driven by external events such as high prices or shortages, our continued coverage by the media is an indicator of the relevance and importance of our information.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets for FY 2002.	N/A
FY 2001	There were no related Targets for FY 2001.	N/A
FY 2000	There were no related Targets for FY 2000.	N/A

Program Goal	Assessment
ER 9-1 Bonneville Power Administration - Ensure Federal hydropower is marketed and delivered while passing the North American Electric Reliability Council’s (NERC’s) Control Compliance Ratings, meeting planned repayment targets, and achieving a recordable accident frequency rate at or below our safety performance standard.	Met 100% of the Goal
Commentary – No commentary provided.	

Annual Target for FY 2003	Assessment
ER9-1a Ensure that the power system control area operated by the Bonneville Power Administration receives, Control Compliance Ratings of “Pass” on both of the North American Electric Reliability Council’s reliability performance standards in every month	Met 100% of the Target
Commentary – System reliability continues to be high, under a variety of performance measures. Bonneville attained "pass" ratings for each of the 12 months for both of the North American Electric Reliability Council (NERC) Control Performance Standards used, which measure the balance between power generation and load: one standard measures generation/load balance and support-system frequency in one-minute intervals; the other standard limits any imbalance magnitude to acceptable levels. System reliability has received much attention due to the Northeast blackout of August. Bonneville's system has performed reliably, although it is recognized that significant investment in the infrastructure is needed in the near future to maintain this level of reliability. Funds have been budgeted for improvements to critical infrastructure, and third-party financing is being investigated.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Bonneville Power Administration will receive monthly Control Performance Ratings of “Pass” using the North American Electric Reliability Council performance standards. Result: The CPS 1 “pass” rating must be at least 100% for each month in the reporting period and the CPS 2 “pass” rating must be at least 90% for each month in the reporting period to achieve the “green” status. Bonneville Power Administration’s CPS 1 measure exceeded 100% for each month in the four quarters of FY 2002, with an average of 197.5% over that period. Bonneville’s CPS 2 measure exceeded 90% for each month in the four quarters of FY 2002, with an average of 96.8% over that period.	MET GOAL
FY 2001	Reliability Performance for BPA was on-target.	MET GOAL

FY 2000	Ensured that each power system control area operated by a Power Marketing Administration received, for each month of the fiscal year, a Control Compliance Rating of "Pass" using the North American Electric Reliability Council performance standard.	MET GOAL
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Annual Target for FY 2003		Assessment
ER9-1b	Bonneville Power Administration will meet planned repayment of principal on power investment.	Met 100% of the Target
<p>Commentary – Scheduled repayment made on time and in full on September 30, 2003. Bonneville's actual FY 2003 principal-amortization payment to the U.S. Treasury of \$543.7 million was \$327.9 million higher than the scheduled payment. The discretionary amounts included \$12.7 million associated with facilities that Bonneville sold during the fiscal year and \$315.2 million of advanced amortization done to optimize Bonneville's entire portfolio of Federal and non-Federal debt. Total advanced amortization of Federal debt now stands at \$800 million. Bonneville's FY 2003 performance was accomplished in a very challenging business environment that included slow economic activity and below-normal stream-flows in the hydroelectric generation system. Bonneville cut operating costs drastically and instituted a 2-percent rate increase to close a forecasted financial gap.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Bonneville Power Administration will meet planned repayment of principal on power investment. Result: Planned amortization of \$46.5 million for appropriations and \$192.5 million for BPA bonds was paid in September 2002. Advance amortization of \$266 million was also paid in September 2002. This consisted of \$150.5 million for appropriations and \$115.5 million for BPA bonds.	MET GOAL
FY 2001	Reliability Performance for BPA was on-target.	MET GOAL
FY 2000	Meet planned repayment of principal on power investment.	MET GOAL

Annual Target for FY 2003		Assessment
ER9-1c	Bonneville Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.	Met 100% of the Target
<p>Commentary – System reliability continues to be high, under a variety of performance measures. Bonneville's overall recordable accident frequency rate for the year of 2.6 per 200,000 hours worked is below both the 3.3 frequency rate and the Bureau of Labor's most recent rate of 5.0. Bonneville's safety performance for the year revealed a slight increase in the accident rate from prior years, after several years of steady decreases. This appears to be the result of our aging workforce. Nevertheless, Bonneville continues to be well below the benchmark. Safety-promoting efforts are being directed at Supervisors' safety responsibilities through training and performance standards.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Bonneville Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.</p> <p>Result: At the end of the fourth quarter of FY 2002, Bonneville had a recordable accident frequency rate of 1.7 per 200,000 hours worked, which is below both the 3.3 frequency rate and the Bureau of Labor's most recent rate of 4.8.</p>	MET GOAL
FY 2001	Reliability Performance for BPA was on-target.	MET GOAL
FY 2000	Achieved a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.	MET GOAL

Program Goal	Assessment
<p>ER 9-2 Southwestern Power Administration - Ensure Federal hydropower is marketed and delivered while passing the North American Electric Reliability Council's (NERC's) Control Compliance Ratings, meeting planned repayment targets, and achieving a recordable accident frequency rate at or below our safety performance standard.</p> <p>Commentary – No commentary provided.</p>	Met above 80%, but below 100% of the Goal

Annual Target for FY 2003	Assessment
<p>ER9-2a Ensure that the power system control area operated by the Southwestern Power Administration receives, Control Compliance Ratings of "Pass" on both of the North American Electric Reliability Council's reliability performance standards in every month</p> <p>Commentary – After four quarters, Southwestern has a "Pass" on 24 out of 24 control compliance ratings. Fourth quarter results are 173.56 for CPS1 and 99.45 for CPS2. Ratings for the 12 month period are 187.24 for CPS1 and 99.47 for CPS2. Southwestern exceeded the NERC control compliance standards of balancing generation to load. Although lower than the 12 month period, the fourth quarter results are consistent with the industry average and reflect Southwestern efforts to operate the power system efficiently with less wear on equipment, while maintaining reliability. Southwestern uses the NERC data to gauge how well the power system is performing and to determine if operational adjustments need to be made. Southwestern's performance is important to the overall reliability of the Eastern Interconnection electrical operations.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Southwestern Power Administration will receive monthly Control Performance Ratings of "Pass" using the North American Electric Reliability Council performance standards. Result: Southwestern Power Administration (Southwestern) has an average</p>	MET GOAL

	Control Performance Standards (CPS) 1 rating for FY 2002 of 193.29%. Southwestern has an average CPS 2 rating for FY 2002 of 99.68%. (MET GOAL)	
FY 2001	Reliability Performance for SWPA was on-target.	MET GOAL
FY 2000	Ensured that each power system control area operated by a Power Marketing Administration received, for each month of the fiscal year, a Control Compliance Rating of "Pass" using the North American Electric Reliability Council performance standard.	MET GOAL

Annual Target for FY 2003		Assessment
ER9-2b	Southwestern Power Administration will meet planned repayment of principal on power investment	Met above 80%, but below 100%, of the Target
<p>Commentary – Southwestern planned to repay \$28.1 million on the Federal investment in FY 2003. The estimated repayment is \$22.7 million. Planned repayment is based on annual average water conditions. In FY 2003, Southwestern experienced below average water conditions, particularly in the 4th quarter, and consequently did not meet its planned repayment. Repayment on the Federal investment is made over a 50-year period. In FY 2003, the Federal investment that is due to be paid will be paid on-time. Through FY 2003, Southwestern has repaid an estimated 48% of the cumulative Federal investment.</p> <p>Plan of Action - Southwestern will perform annual repayment studies in FY 2004 to determine whether rates are sufficient to repay the Federal investment. If a rate adjustment is necessary, Southwestern will file new rates with the Federal Energy Regulatory Commission to recover all costs.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Southwestern Power Administration will meet planned repayment of principal on power investment. Result: FY 2002 revenues available for repayment are presently estimated at 105% of planned repayment of principal on the Federal power investment. However, audited financial statements for the consolidated Federal power system, which includes both the U.S. Army Corps of Engineers generating projects and Southwestern's transmission system, will not be available by October 31, 2002.	MET GOAL
FY 2001	(2) Principal Repayment (ER9): SWPA Plan of Action: Southwestern Power Administration nearly met repayment target because rainfall was below normal. Southwestern's corrective action: conduct power repayment study to see if rates need to be adjusted.	NEARLY MET GOAL
FY 2000	Met planned repayment of principal on power investment.	MET GOAL

Annual Target for FY 2003		Assessment
ER9-2c	Southwestern Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower. (Safety performance is measured using the recordable accident frequency rate [RAFR] for recordable injuries per 200,000 hours worked)	Met 100% of the Target
<p>Commentary – Actual recordable accident frequency rate for the fourth quarter was zero. The annual recordable frequency rate is 1.3. Southwestern incurred two recordable accidents in the first quarter and none for the remainder of the fiscal year. In FY 2003, Southwestern implemented a Plan of Action to improve its safety record. As a result, employees are more aware of hazards connected with their jobs and ways to avoid accidents. Southwestern has an excellent safety record compared to the Bureau of Labor Statistics' electric utility industry average of 4.8, thereby contributing to the safety of employees and the reliability of the interconnected transmission system.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Southwestern Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.</p> <p>Result: At the end of FY 2002, Southwestern has a recordable accident frequency rate of 5.5 or 67% above the 3.3 recordable accident frequency rate.</p> <p>Plan of Action: Southwestern has had one recordable injury due to electrical contact over a fifty-nine year period. The majority of incidents involve back injuries due to falls and lifting heavy objects. Even though the incidents have not been life threatening, they have caused lost workdays. Southwestern is concerned about the obvious preventable incidents and is implementing the following plan of action:</p> <ul style="list-style-type: none"> • Place more emphasis on job briefings and job hazard analysis; • Conduct ergonomic training to address proper lifting and other correct work postures; • Involve employees in safety meetings by making peer presentations on how to work more safely and think safety before and during performance of a given task. Sessions will focus on slips, trips and falls, ergonomics, and attitude toward working safely; • Conduct formal safety presentations directed toward improving safety performance; • Assign collateral safety responsibility to the foreman and team leaders who will also attend Safety and Health Team meetings by teleconference every other month; • Perform a comprehensive review of standard operating work procedures to properly address slips, trips and falls, job hazard analysis and ergonomics; • Review the safety awards program for effectiveness; 	NOT MET

	<ul style="list-style-type: none"> • Review employee performance elements to include a safety element; and • Involve the local union International Brotherhood of Electrical Workers in the safety program by presenting on-site safety meetings on safe working conditions and practices. 	
FY 2001	Recordable accident frequency rate for the SWPA was on-target.	MET GOAL
FY 2000	Achieved a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.	MET GOAL

Program Goal	Assessment
<p>ER 9-3 Southeastern Power Administration - Ensure Federal hydropower is marketed and delivered while passing the North American Electric Reliability Council's (NERC's) Control Compliance Ratings, meeting planned repayment targets, and achieving a recordable accident frequency rate at or below our safety performance standard.</p> <p>Commentary – Achieved a 'pass' on all six of NERC's CPS 1 and CPS 2 Performance Standards for each month of the 4th quarter, FY 2003. Southeastern continued to achieve high reliability standards as defined by the North American Regulatory Council (NERC). Southeastern successfully balanced power generation and load to receive a CPS-1 rating of greater than 100. Southeastern maintained any imbalances within an acceptable range and received a CPS-2 rating of >90. Southeastern's ability to monitor and operate its resources within acceptable limits enhances the reliability of power resources in the Southeast.</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>ER9-3a Ensure that the power system control area operated by the Southeastern Power Administration receives, Control Compliance Ratings of "Pass" on both of the North American Electric Reliability Council's reliability performance standards in every month.</p> <p>Commentary – Passed all 6 CPS 1 and CPS 2 ratings for the fiscal year.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)	Assessment
<p>FY 2002 Target: Southeastern Power Administration will receive monthly Control Performance Ratings of "Pass" using the North American Electric Reliability Council performance standards. Result: The CPS 1 pass rating must average 100% over a rolling 12-month period. The average CPS 1 rating for nine months of the fiscal year through June 30, 2002 is 221.17%. The CPS 2 pass rating is 90% in each month, and Southeastern has an average CPS 2 rating for nine months of the fiscal year through June 30, 2002 of 99.09%.</p>	MET GOAL
<p>FY 2001 Reliability Performance for the SEPA was on-target.</p>	MET GOAL

FY 2000	(1) Ensured that each power system control area operated by a Power Marketing Administration received, for each month of the fiscal year, a Control Compliance Rating of “Pass” using the North American Electric Reliability Council performance standard.	MET GOAL
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Annual Target for FY 2003		Assessment
ER9-3b	Southeastern Power Administration will meet planned repayment of principal on power investment.	Met 100% of the Target
<p>Commentary – Southeastern met 175 % of its annual planned repayment of Federal principal at the end of FY 2003. Above average water conditions, revised repayment plans and reformulated rates in two major hydropower systems enabled Southeastern to achieve 175 % of its repayment plan target.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Southeastern Power Administration will meet planned repayment of principal on power investment. Result: Net revenues for FY 2002 are below 80% of planned repayment of principal of the Federal investment. This is the result of several years of severe drought in the southeastern United States. Power purchase and wheeling expenses are high and revenue is considerably lower.</p> <p>Plan of Action: Southeastern has proposed rate increases to increase revenue, changed rate design to pass through Power purchase and wheeling charges, and increased cost recovery from fixed charges. Rate studies are being evaluated to address one of the worst drought periods on record.</p>	NOT MET
FY 2001	<p>Meet Principal Repayment goal for SEPA.</p> <p>Plan of Action: Southeastern Power Administration was below expectation on the repayment target because of severe drought for the last three years with less power generation from hydroelectric projects. Southeastern’s Corrective Action: Review repayment studies and change rates, as necessary, according to Federal regulation to bring repayment up to established goals and schedules.</p>	BELOW EXPECTATIONS
FY 2000	<p>Meet planned repayment of principal on power investment.</p> <p>Plan of Action: Southeastern Power Administration was below expectation on the repayment target because of severe drought for the last three years with less power generation from hydroelectric projects. Southeastern’s Corrective Action: Review repayment studies and change rates, as necessary, according to Federal regulation to bring repayment up to established goals and schedules.</p>	NEARLY MET GOAL

Annual Target for FY 2003		Assessment
ER9-3c	Southeastern Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower. (Safety performance is measured using the recordable accident frequency rate [RAFR] for recordable injuries per 200,000 hours worked)	Met 100% of the Target
Commentary – None provided.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Southeastern Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower. Result: At the end of FY 2002, Southeastern has a recordable accident frequency rate of 0.0%. Plan of Action: Anticipating few recordable accidents for the remainder of this fiscal year, Southeastern will continue to emphasize safety issues.	MET GOAL
FY 2001	Meet recordable accident frequency rate for SEPA.	MET GOAL
FY 2000	Achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.	MET GOAL

Program Goal	Assessment
ER 9-4 Western Area Power Administration - Ensure Federal hydropower is marketed and delivered while passing the North American Electric Reliability Council's (NERC's) Control Compliance Ratings, meeting planned repayment targets, and achieving a recordable accident frequency rate at or below our safety performance standard.	Met 100% of the Goal
Commentary – No commentary provided.	

Annual Target for FY 2003		Assessment
ER9-4a	Ensure that each power system control area operated by the Western Area Power Administration receives, Control Compliance Ratings of "Pass" on both of the North American Electric Reliability Council's reliability performance standards in every month.	Met 100% of the Target
Commentary – All four Western Control Areas achieved the goal of "pass" rating for both CPS1 and CPS2 for FY 2003. This measure is used to gauge power system performance using the instantaneous difference between loads and generation. A control Compliance Rating of "Pass" is achieved when a power system receives, for each month of the fiscal year, a CSP1 performance level of 100% minimum and a CPS2 performance level of 90% minimum. All Western Control Areas "passed" for all months in FY 2003,		

exceeding the minimum requirements.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Western Area Power Administration will receive monthly Control Performance Ratings of “Pass” using the North American Electric Reliability Council performance standards. Result: The CPS 1 pass rating must average 100% over a rolling 12-month period. The CPS 2 pass rating is 90% in each month. Western has an average CPS 1 rating for FY 2002 of 185.7%. Western’s average CPS two for the same period is 98.5%.	MET GOAL
FY 2001	Meet the Reliability Performance goal for WAPA.	MET GOAL
FY 2000	Ensured that each power system control area operated by a Power Marketing Administration received, for each month of the fiscal year, a Control Compliance Rating of “Pass” using the North American Electric Reliability Council performance standard.	MET GOAL

Annual Target for FY 2003		Assessment
ER9-4b	Western Area Power Administration will meet planned repayment of principal on power investment.	Met 100% of the Target
<p>Commentary –Collective data for all Western projects through the 4th quarter of FY 2003 indicates that the planned repayment of principal on Federal power investment forecasted for FY 2003 was met 100% - exceeding the measure standard by 5%.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Western Area Power Administration will meet planned repayment of principal on power investment. Result: Complete. During FY 2002, power generation and transmission activities provided for total payment of unpaid investment of \$24.0 million. Additional net repayment of \$33.2 million was made as a result of replacing estimates of revenues and expenses used in previous power repayment studies with actual amounts. As a result, total payment activity in FY 2002 equaled \$57.2 million. This adjusted amount exceeded the planned principal repayment of \$30.9 million by \$26.3 million.	Met Goal
FY 2001	Principal Repayment: WAPA Plan of Action: Repayment targets were below expectations due to below normal rainfall over several watersheds in the marketing area. WAPA will conduct power repayment studies for each project and initiate rate adjustments where needed to ensure all investments are	BELOW EXPECTATIONS

	repaid within their allowable repayment periods.	
FY 2000	Met planned repayment of principal on power investment.	MET GOAL

Annual Target for FY 2003		Assessment
ER9-4c	Western Area Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower (Safety performance is measured using the recordable accident frequency rate [RAFR] for recordable injuries per 200,000 hours worked).	Met 100% of the Target
<p>Commentary –Collective data for all Western projects through the 4th quarter of FY 2003 indicates that the planned repayment of principal on Federal power investment forecasted for FY 2003 was met 100% - exceeding the measure standard by 5%.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Western Area Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.</p> <p>Result: Western's total recordable accident rate for FY 2002 is 1.7, far exceeding its goal of 3.3. The latest Bureau of Labor Statistics Rate is 4.8.</p>	MET GOAL
FY 2001	Meet the recordable accident frequency rate for WAPA.	MET GOAL
FY 2000	Achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics' industry rate, whichever is lower.	MET GOAL

Additional Annual Targets from FY 2002-2000 Assigned to Goal 4: Energy Security

Additional Targets from FY 2002-2000	Assessment
<p>FY 2002 Target: Complete two, and based on the technical merits of the grants, approve the continuation of 12 research and curriculum development awards funded by three-year Advanced Nuclear Medicine Initiative grants to universities, hospitals and research institutions. Result: Two three-year Advanced Nuclear Medicine Initiative grant projects have been completed. Technical merits of the 12 continuation research and curriculum development grants were evaluated using a peer-review process. Two continuation grants were awarded and ten continuation grants were not awarded before the end of the year. Plan of Action: The remaining ten funding continuations are being processed and will be awarded by the end of the first quarter of FY 2003.</p>	MIXED RESULTS
<p>Target: Complete upgrades to the FFTF fuel handling control systems and achieve readiness to initiate their validation in FY 2003. Result: Upgrades to the FFTF fuel handling control systems were completed and readiness to initiate their validation in FY 2003 has been achieved.</p>	MET GOAL
<p>Target: Negotiate implementation of a revised Hanford Federal Facility Agreement and Consent Order milestones for FFTF deactivation. Result: Signatories to the Hanford Federal Facility Agreement have accepted implementation of revised milestones that would result in completion of FFTF deactivation in February 2011.</p>	MET GOAL
<p>Target: Meet the milestones for legacy waste cleanup at Test Reactor Area (TRA) in the Voluntary Consent Order between the State of Idaho and DOE, and efficiently manage resources to limit growth in the backlog of maintenance to no more than 10%. Result: The Voluntary Consent Order milestones for FY 2002 for legacy waste cleanup at TRA have been completed. The growth in the maintenance backlog for TRA was 6% for FY 2002, which meets the goal of limiting the growth to no more than 10%.</p>	MET GOAL
<p>Target: Develop conceptual design of a Stirling Radioisotope Power System suitable for space exploration missions. Result: The conceptual design of a Stirling Radioisotope Power System for space exploration missions has been completed. As part of a competitive procurement, conceptual designs were developed by three contractors. One contractor was selected to proceed to develop their design and fabricate and test an engineering unit. This system, when developed, supports the Department's capability to provide electrical power for spacecraft in future NASA missions.</p>	MET GOAL
<p>Target: Complete assessment of special purpose fission technology options required to power advanced spacecraft to the outer planets and on the surface of Mars. Result: The assessment of fission technology options for space applications was completed. A summary assessment report was prepared that addressed both power for advanced spacecraft and for power on the surface of Mars.</p>	MET GOAL
<p>Target: Supply quality stable and radioactive isotopes for industrial, research, and medical applications that continue to meet customer specifications no less</p>	MET GOAL

	than 97% of the time, and maintain 95% on-time deliveries. Result: Quality stable and radioactive isotopes for industrial, research, and medical applications met customer specifications greater than 98% of the time, and on-time deliveries were also 98% for radioisotopes and for stable isotopes.	
FY 2001	Completed negotiations with industrial teams selected to implement the Early Entrance Co-production Plant (EECP) projects, and initiated Phase I of the three-phase activity.	MET GOAL
	Completed laboratory evaluation of the initial set of hydrogen separation membranes.	MET GOAL
	Began laboratory scale test operations of a novel syngas ceramic membrane reactor to reduce gas-to-liquid fuel conversion costs, and initiated construction of first stage scale-up of the reactor.	MET GOAL
	Provided five grants under the Advanced Nuclear Medicine Initiative.	MET GOAL
	Completed the conversion and disposition of 100% of the Fermi reactor sodium coolant in storage at ANL-W.	MET GOAL
	Completed draining the EBR-II primary system and process 100% of all EBR-II sodium in compliance with the INEEL Site Treatment Plan.	MET GOAL
	Treated a minimum of 0.5 metric tons of heavy metals (MTHM) of EBR-II spent nuclear fuel).	MET GOAL
	Established new international agreement on advanced accelerator applications programs with at least one country that significantly leverages financial and technical resources, to the mutual benefit of both countries, particularly in areas such as safety, fuels and materials development, and facility operations.	MET GOAL
	Competitively selected system integration contractor to develop a flight qualified Stirling Radioisotope Power System for future space exploration missions.	NEARLY MET GOAL
	Plan of Action: The three contractors submitted final revised proposals for the second and third phases of the contract. The revised proposals were evaluated by the Source Evaluation Board (SEB) in August 2001. The program was ready to make an award in FY 2001; however, contract award was delayed into FY 2002 waiting funding from NASA.	
	Completed an initial assessment of special purpose fission technologies that are focused on concepts and technologies for space applications.	MET GOAL
	Supplied quality stable and radioactive isotopes for industrial, research, and medical applications that met customer specifications no less than 97% of the time, and maintained 95% on-time deliveries.	MIXED RESULTS
FY 2000	Complete solicitation for, and selection of, candidate industrial teams for the Early Entrance Co-production Plant (EECP) project in which innovative	MET GOAL

alternative fuels will be co-produced along with electricity and chemical products.	
Implemented the Advanced Nuclear Medicine Initiative by providing isotopes or financial assistance for at least five researchers.	MET GOAL
Completed the conversion and disposition of 100% of the secondary sodium coolant from EBR-II, and 40% of the Fermi reactor sodium coolant in storage at ANL-W.	MET GOAL
Initiated draining sodium from the EBR-II primary system and processing it for disposal.	MET GOAL
Established a science and engineering based research program into Accelerator Transmutation of Waste (ATW) technology development. Commenced systems studies to establish and evaluate technology options and narrow choices. Issued a Program Plan for the conduct and management of the ATW research program.	MET GOAL
Executed an industrial contract and initiated associated laboratory efforts to develop small Radioisotope Thermoelectric Generators (RTGs) for anticipated use on NASA's Europa Orbiter and Pluto/Kuiper missions planned for launch in 2003 and 2004.	MET GOAL
Supplied quality stable and radioactive isotopes for industrial, research, and medical applications that met customer specifications and maintained 95% on-time deliveries.	NEARLY MET GOAL
Plan of Action: As of September 30, 2001, the Medical Isotope program exceeded 94% on-time deliveries out of 589 shipments and met customer specifications at 99%, however, the events of September 11 th did cause a small number of shipments to be late.	

Goal 5: Science

Summary of FY 2003 Annual Performance

57

Targets
Met

4

Targets
Not Met

FY 2002 Net Costs (in thousands):

Goal 5 Costs: \$2,830,000

FY 2003 Net Costs (in thousands):

Goal 5 Costs: \$3,068,000

Refer to Page 303 of the Financial Results section for a consolidated statement of net cost by Goal

Annual Performance Goals and Targets FY 2000 – FY 2003 Results

General Goal Five: World-Class Scientific Research Capacity: Provide world-class scientific research capacity needed to ensure the success of Department missions in national and energy security, to advance the frontiers of knowledge in physical sciences and areas of biological, medical, environmental, and computational sciences, and to provide world-class research facilities for the Nation's science enterprise.

Program Goal

SC 1-1 Exploit U.S. leadership at the energy frontier by conducting an experimental research program that will establish the foundations for a new understanding of the physical universe.

Assessment

Met less than
80% of the
Goal

Commentary – High energy physics experiments concerning the Standard Model involve precise measurements of phenomena buried in a background of noise or conventional physics processes. A typical accelerator experiment will record multiple interactions of many extremely high-energy particles occurring in a very short period of time.

Annual Target for FY 2003

SC 1-1a Deliver integrated luminosity as planned 225 pb⁻¹ to CDF and D-Zero at the Tevatron.

Assessment

Met 100% of
the Target

Commentary – Luminosity is a measure of particle interaction, specifically the chance that a proton will collide with an antiproton; the higher the luminosity, the greater the chance of massive particle production. Integrated luminosity 'integrates' out the time dependence, so we get a total number of events. To achieve high integrated luminosity, as many particles as possible must be placed into as small a space (detector) as possible. Scientists are eager to increase integrated luminosity and hence to produce more collisions, increasing the chance of observing new particle reactions involving quarks and other fundamental building blocks of matter.

In FY 2003, Fermilab achieved total integrated luminosity of 240 inverse picobarns, a measure for the collision rate of protons and anti-protons inside the accelerator tunnel, exceeding the annual target of 225 inverse picobarns by 7 percent.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Deliver integrated luminosity as planned (80 pb-1) to the Collider Detector Facility (CDF) and D-Zero at the Tevatron. Begin implementation of the second phase of accelerator upgrades: install four performance improvements to existing systems, and begin design and construction of two new systems. Result: Delivered integrated luminosity as planned (80 pb-1) to Collider Detector Facility (CDF) and D-Zero at the Tevatron. Began implementation of the second phase of accelerator upgrades: installed four performance improvements to existing systems, and began design and construction of two new systems.</p>	Met Goal
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	<p>Moved the newly upgraded D-Zero and CDF detectors at Fermilab into position in the Main Injector tunnel, and began commissioning in the third quarter of the fiscal year.</p> <p>Plan of Action: The Office of Science has developed extensive plans specific to each detector to adjust to any possible, last-minute delays, virtually assuring a successful start-up of Run II on the present schedule of March 2001. In the case of D-Zero, the plan calls for the installation of a partial Silicon Tracker system, if necessary to hold the schedule, which would be augmented during a Collider shutdown at a later date. This scenario would allow the D-Zero detector to be efficiently commissioned, although full physics capability would be delayed by up to six months. In FY 2001, successful start-up of Run II and installation of the Silicon Tracker system were successfully completed.</p> <p>Furthered the progress on achieving luminosity and operational efficiency for the Tevatron at Fermilab in its new mode of operation with the recently completed Main Injector.</p>	Nearly Met Goal

Annual Target for FY 2003		Assessment
SC 1-1b	Complete research and development of two new accelerator systems for the recycler and the Tevatron electron lens.	Met less than 80% of the Target
<p>Commentary – Research and development was completed on one of the two new accelerator systems. The Tevatron Electron Lens task has been completed and is working as planned. Recycler systems were installed, but not commissioned in FY 2003 due to vacuum problems. The Recycler system is approximately 65% complete and scheduled to be commissioned by summer FY 2004.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002.	N/A
FY 2001	Completed first phase of upgrades to enable the Tevatron at Fermilab to run with much higher luminosity. Began commissioning of phase-one accelerator upgrades.	Met Goal
	Completed and commissioned upgrades of CDF and D-Zero detectors at the Tevatron facility at Fermilab.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 1-2 Explain the observed absence of antimatter in the universe through understanding of the phenomenon of Charge Parity (CP) Violation.	Met at or above 80%, but less than 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 1-2a Increase the total data delivered to BaBar at the SLAC B-factory by delivering 45 fb-1 of total luminosity.	Met less than 80% of the Target
Commentary – Target not met. The total data delivered to the BaBar at the SLAC B-Factory was 40fb-1. However, this reduction of 5fb-1 in data from the annual target did not negatively impact progress toward the SC1-2 overall goal. Slower than expected recovery from accelerator downtime in first quarter FY 2003 resulted in missing the annual target goal. FY 2004 target goal will be re-evaluated based on actual performance in first quarter, FY 2004.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Increase the total data recorded by BaBar at the Stanford Linear Accelerator Center (SLAC) B-factory by delivering 35 fb-1 of total luminosity. Result: The B-Factory delivered over 40 fb-1 of data to the BaBar detector in FY 2002.	Met Goal
FY 2001	Delivered sufficient luminosity (25 fb-1) to double total BaBar data set.	Met Goal
FY 2000	Operated the B-factory at the Stanford Linear Accelerator Center, the Main Injector for the Tevatron at Fermilab, the Thomas Jefferson National Accelerator Facility, and the Relativistic Heavy Ion Collider at Brookhaven National Laboratory (BNL), and delivered on FY 2000 U.S. /DOE commitments to the international Large Hadron Collider project.	Met Goal

Annual Target for FY 2003		Assessment
SC 1-2b	Add one new Radio Frequency RF station.	Met 100% of the Target
Commentary – As planned, one Radio Frequency Station has been successfully added.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Add one new Radio Frequency (RF) station. Result: Completed in FY 2002.	Met Goal
FY 2001	Added one new Radio Frequency (RF) station.	Met Goal
FY 2000	There were no related targets in FY 2000.	N/A

Annual Target for FY 2003		Assessment
SC 1-2c	Measure CP violation in B mesons with an uncertainty of +/- 0.06.	Met 100% of the Target
Commentary – The target was met. The CP Violation in B mesons with an uncertainty of +/- 0.06 was successfully achieved in the third quarter of FY 2003.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Measure Charge Parity (CP) violation in B mesons with an uncertainty of +/- 0.12. Precise measurement of CP violation will help advance understanding of the preponderance of matter over antimatter in the universe. Result: The BaBar Collaboration submitted a paper to Physical Review Letters in July 2002 with a measurement of CP violation in the simplest decay mode with an uncertainty +/-0.07. (Met Goal)	Met Goal
FY 2001	BaBar collaboration published first unambiguous observation of Change Parity (CP) violation in B meson decays with an uncertainty of +/- 0.15. (Met Goal)	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 2-1 Determine the structure of nucleons in terms of bound states of quarks and gluons. Measure the effects of this structure on the properties of atomic nuclei.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 2-1a Collect first data with the BLAST detector at MIT/Bates, studying the structure of nucleons and few body nuclei as elements of the electron beam program.	Met 100% of the Target
Commentary – First data from the BLAST detector at MIT/Bates have been successfully collected, supporting elements of the electron beam program.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: As elements of the electron beam program, (a) complete commissioning of the BLAST detector at MIT/Bates and initiate first measurements, and (b) complete fabrication, installation and commissioning of the G0 detector, a joint National Science Foundation-DOE project, at Thomas Jefferson National Accelerator Facility (TJNAF). Result: (a) The commissioning of the BLAST detector is proceeding and commissioning is scheduled for October 31, 2002. (b) The G0 detector has been fabricated and installed at Thomas Jefferson National Accelerator Facility and commissioned. It is ready for beam.	Mixed Results
FY 2001	Completed fabrication of the Bates Large Acceptance Spectrometer (BLAST) detector at Massachusetts Institute of Technology (MIT) in accordance with the project milestones. (Met Goal) As elements of the electron beam program, (a) completed fabrication of the BLAST detector at MIT/Bates in accordance with project milestones, and (b) conducted precise studies of nucleon structure, including studies of the proton's internal charge distribution and role of Quantum Chromodynamics (QCD) in nuclear structure by delivering high intensity (140 micro amps), highly polarized (75%) electron beams with Continuous Electron Beam Accelerator Facility (CEBAF) at Thomas Jefferson National Accelerator Facility (TJNAF).	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 2-1b	Map out the strange quark contribution to nucleon structure using the G-0 detector, utilizing the high intensity polarized electron beam developed at TJNAF as elements of the electron beam program.	Met 100% of the Target
<p>Commentary – Data from the initial G-0 Engineering Run have been analyzed and preparations are underway for a second Engineering Run. At the Thomas Jefferson National Accelerator Facility (TJNAF), the research program using the G-0 detector to measure the strangeness content of the proton over a wide range of momentum transfer was initiated in FY 2003.</p> <p>A quantitative understanding of the internal structure of the nucleons (proton and neutron) requires a description of the observed properties in terms of the underlying quarks and gluons of Quantum Chromo-Dynamics (QCD), the theory of 'strong' interactions. Furthermore, this understanding would allow the nuclear binding force to be described in terms of the QCD interactions among the quarks.</p> <p>Data from TJNAF indicate the existence of a new kind of matter that contains five quarks rather than the two or three quarks that make up all matter presently observed. Identification of this particle along with the observation of additional particles of similar five-quark structure would provide vital information on how quarks and gluons interact to form nuclear matter.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: As elements of the electron beam program, (a) complete commissioning of the BLAST detector at MIT/Bates and initiate first measurements, and (b) complete fabrication, installation and commissioning of the G0 detector, a joint National Science Foundation-DOE project, at Thomas Jefferson National Accelerator Facility (TJNAF). Result: (a) The commissioning of the BLAST detector is proceeding and commissioning is scheduled for October 31, 2002. (b) The G0 detector has been fabricated and installed at Thomas Jefferson National Accelerator Facility and commissioned. It is ready for beam.	Mixed Results
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 2-1c	Collect first data with polarized protons with the Solenoidal Tracker at RHIC (STAR), Pioneering High Energy Nuclear Interacting Experiment (PHENIX), and pp2pp detectors.	Met 100% of the Target
<p>Commentary – Met 100% of annual target. Polarization periodically exceeds 40 percent with the average polarization standing at 30 percent for beams at 100 GeV. Both the STAR and PHENIX successfully took polarized proton data during a 4-week data period following a 6-week polarized beam commissioning period.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Commission polarized protons at the Relativistic Heavy Ion Collider (RHIC) for research programs directed at understanding the spin structure of the proton. Result: Polarized proton beams were successfully commissioned at RHIC and an initial measurement was made. A polarization of 25% was achieved for beams at 100 GeV.	Met Goal
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Additional Annual Targets from FY 2002-2000		Assessment
FY 2002	There were no related targets in FY 2002.	N/A
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 2-2 Determine the behavior and properties of hot, dense nuclear matter as a function of temperature and density. Discover and characterize the quark-gluon plasma, if it is possible to be created under laboratory conditions.	Met 100% of the Goal
Commentary – No Commentary provided.	

Annual Target for FY 2003	Assessment
SC 2-2a Initiate first round of experiments with collisions with other ions to compare to results of gold-gold collisions.	Met 100% of the Target
Commentary – Met 100% of the annual target of initiating first round of gold-gold collision experiments. All four detectors successfully took data and results were analyzed and presented at a Special RHIC Colloquium at Brookhaven National Laboratory this Fiscal Year. Papers were submitted for publication by all four collaborations.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Complete first round of experiments at RHIC at full energy; achieve the full design luminosity (collision rate) of 2×10^{26} per cm^2 per second for heavy ions. Result: The Relativistic Heavy Ion Collider (RHIC) facility produced heavy ion collisions at the full energy of 200 GeV per nucleon-nucleon collision, achieving a maximum collision rate (luminosity) of $2 \times 10^{26} \text{cm}^2/\text{second}$, with data recorded from collisions in all four heavy-ion detectors. The first round of physics experiments at full energy has been completed, with 37 papers either published or submitted for publication to refereed journals.	Met Goal

FY 2001	Produced first heavy-ion collisions at the Relativistic Heavy Ion Collider RHIC (construction completed FY 1999) at 10% of its design luminosity, as planned, with four experimental detectors. Published first results of heavy-ion collisions.	Met Goal
	Continued major accelerator improvement projects at RHIC in order to improve machine reliability and efficiency.	Met Goal
FY 2000	Advanced knowledge from experiments at the RHIC to see possible evidence of the predicted quark-gluon plasma (a high-temperature, high-density state of nuclear matter that may have existed a millionth of a second after the “Big Bang”).	Met Goal

Program Goal	Assessment
SC 2-3 Determine the low energy properties of nuclei, particularly at their limits of stability. Use these properties to understand energy generation and the origin of the elements in stars, and the fundamental symmetries of the “Standard Model” of elementary particle physics.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003		Assessment
SC 2-3a	Collect the first data from KamLAND, a joint U.S.-Japan experiment measuring neutrinos produced in nuclear reactors.	Met 100% of the Target
Commentary – The KamLAND detector has collected its first data, and continues to operate with minimal disruptions for calibration and maintenance.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 2-3b	Complete preparation for tests of the prototype high-energy, high-power gas catcher for the Rare Isotope Accelerator (RIA).	Met 100% of the Target
<p>Commentary – FY 2003 target was achieved. Additionally, low-energy online tests of the RIA gas catcher at ANL were started. The results of these tests have been analyzed and the performance obtained meets the design goals. Preparations at GSI in Germany for the final high-energy tests have been completed. Prior to the end of FY 2003, the gas catcher was sent to GSI.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Construct a prototype high-energy, high-power gas catcher for RIA. Result: The assembly of the mechanical parts of the seven sections of the main body was completed and the complete full-scale gas catcher was installed successfully.	Met Goal
FY 2001	Tested low-energy prototype of RIA fast catcher and tested low-beta accelerator cavities.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 2-3c	Prepare for tests of prototype targets for the proposed Rare Isotope Accelerator (RIA).	Met 100% of the Target
<p>Commentary – Met 100% of annual target. Preparations for prototype tests of RIA targets have been completed.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 2-3d	Complete initial beam emittance tests for Electron Cyclotron Resonance (ECR) ion source for RIA	Met 100% of the Target
<p>Commentary – Initial beam emittance tests for the ECR were completed. The VENUS source is being operated at high power with 18 Gigahertz klystron. In August 2003 it produced its first metal beam (bismuth) and its emittance was measured using the 2-axis emittance scanner.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 2-3e	Complete tests for the development of the intermediate energy superconducting Radio Frequency (RF) cavities for the RIA.	Met 100% of the Target
<p>Commentary – The six-cell intermediate energy (RF) cavities were successfully tested in FY 2003. The helium vessel for the six-cell cavity and the Radio Frequency power amplifier have been successfully completed. The horizontal cryomodule has been assembled and is ready for tests according to schedule.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Additional Annual Targets from FY 2002-2000		
FY 2002	<p>Target: Collect the first data from neutral current interactions from SNO.</p> <p>Result: Data has been collected from the SNO and the initial results have been published.</p>	Met Goal
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 3-1 Determine, compare, and analyze DNA sequences of microbes and other organisms that will underpin development of biotechnology solutions for clean energy, carbon sequestration, and environmental cleanup Commentary – No Commentary Provided	Met 100% of the Goal

Annual Target for FY 2003	Assessment
SC 3-1a Complete the high quality DNA sequencing of human chromosome 5. Commentary – High quality DNA sequencing of chromosomes 5, 16, and 19 have been completed to community standards.	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: By the end of FY 2002, the DOE JGI will complete the high quality DNA sequencing of human chromosomes 16 and 19 and produce six billion base pairs of DNA sequence from model organisms (<i>e.g.</i>, mouse, Fugu, and Ciona) to help understand the human sequence as part of the Human Genome Program. Result: JGI has completed the high quality sequencing of Human Chromosome 19, approximately 92% of Human Chromosome 16, and 97% of Human Chromosome 5. The JGI has also produced seven billion bases of sequences completing the draft sequencing of Fugu (the pufferfish) and Ciona (the sea squirt) as its contribution to the Human Genome Program. Our current assessment is that both Human Chromosomes 16 and 5 will be completed by the end of calendar year 2002.</p> <p>Plan of Action: Although DOE JGI was more productive in FY 2002 than anticipated, completion of chromosome 16 was delayed two months to support an accelerated sequencing completion date for all chromosomes by end of calendar year 2002 that was imposed by the International Human Genome Program (IHGP) during FY 2002. The deadline for finishing the Human Genome was pushed forward by one year as well. Chromosomes 5 and 16 will be completed to the international standard by December.</p>	Not Met
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 3-1b	Increase capacity of Production Genomics Facility (PGF) to sequence 12 billion base pairs of DNA per year, an increase of approximately 50% from FY 2002.	Met 100% of the Target
<p>Commentary – The annual target was achieved and surpassed. Approximately 18 billion base pairs of DNA were sequenced.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<i>See SC 3-1a</i>	
FY 2001	By the end of FY 2001, JGI completed the sequencing and submission to public databases of 100 million finished and 250 million high quality draft base pairs of DNA, including both human and model organisms (<i>e.g.</i> , the mouse) as part of the Human Genome Program.	Met Goal
FY 2000	Completed the sequencing of 50 million subunits of human DNA to submit to publicly accessible databases in FY 2000.	Met Goal

Annual Target for FY 2003		Assessment
SC 3-1c	Establish at least 30 diverse collaborations for high throughput DNA sequencing with scientists outside the DOE Joint Genome Institute (JGI) important for conducting Genomics and Genomes to Life research.	Met 100% of the Target
<p>Commentary – All aspects of this annual target were either met or exceeded including; Populus; Chlamydomonas; soy bean pathogen; cellulose degrading fungus; diatom; algae and more than 30 collaborations. The sequencing of the frog at 4.3Bbp was completed in third quarter FY 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 3-1d	Produce draft DNA sequences of more than 30 microbes vital to future U.S. energy security and independence, carbon sequestration, and environmental cleanup.	Met 100% of the Target
<p>Commentary – The DNA sequencing of more than 30 microbial sequences from organisms of relevance to DOE missions of energy carbon sequestration and environmental cleanup were completed as planned.</p> <p>Can we understand the workings of biological systems well enough so that we can use nature's own principles of design to solve energy and environmental challenges? Understanding nature's array of multi protein molecular machines, each with exquisitely precise and efficient functions and controls, will enable us to use and even redesign these molecular machines to address DOE and national needs. A high throughput DNA sequencing user resource to meet DNA sequencing needs of the scientific community is a basic requirement to meet this need.</p> <p>In FY 03 BER sequenced 18 billion base pairs of DNA including the completed draft sequences of 30 microbes. These microbes are important because they have the potential to provide a clean source of energy, remove greenhouse gasses from the atmosphere and sequester or clean up environmental contaminants such as those found at some DOE Sites. Understanding the sequence of these microbes will move us one step closer to being able to use them to address difficult challenges to the Department and the Nation.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Produce draft DNA sequence of more than 30 microbes that cover a range of functional relevance to DOE's life and environmental sciences and security missions, including carbon sequestration, environmental cleanup, bioremediation, and bioterrorism. Result: The DOE Joint Genome Institute (JGI) has draft sequenced 35 microbes. Of these 35 microbes, 11 are relevant to bioterrorism concerns. The remaining 24 organisms are relevant to the other DOE missions.	Met Goal
FY 2001	Completed the genetic sequencing of at least three additional microbes that produce methane or hydrogen from carbonaceous sources, or that could be used to sequester carbon, as part of the Microbial Genomics and Carbon Sequestration programs.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 3-2 Establish the scientific foundation for determining a safe level of greenhouse gases and aerosols in the atmosphere by resolving or reducing key uncertainties in predicting their effects on climate, and provide the foundation to predict, assess, and mitigate potential adverse effects of energy production and use on the environment.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 3-2a Improve the precision of climate models by delivering a more realistic cloud submodel that reduces the uncertainty in calculations of the atmospheric energy budget by 10 percent	Met 100% of the Target
Commentary – Target met. A new cloud parameterization has been introduced into the Community Atmospheric Model with resulting improvements in cloud, radiation, and precipitation fields. The parameterization is currently being evaluated in the CCM3-ARM Parameterization Testbed (CAPT) through comparison with ARM data and global data sets. Initial results from using the models indicate uncertainty has been reduced on the order of 10%.	

Related Annual Targets (FY 2002 – FY 2000)	Assessment
FY 2002 Target: Develop and test a fully coupled atmosphere-ocean-land-sea-ice climate model that has twice the spatial resolution of coupled models available in FY 2000 as part of the Climate Modeling and Prediction research. Support multi-disciplinary teams of scientists at multiple institutions using DOE supercomputers to perform model simulations, diagnostics and testing. Result: The new coupled model was released in May 2002, with an average resolution of 280 km in the atmosphere and 60 km in the ocean. The previous version had resolutions of 200 km and 200 km, respectively. An 800-year equilibrium climate simulation was executed at the National Energy Research Supercomputer Center. Plan of Action: Testing is underway using atmospheric configurations of 140 km, 70 km, and 35 km. A fully tested version of the coupled model with 140 km atmospheric resolution is over 80% complete and will be ready by the end of December 2002.	Mixed Results
FY 2001 There were no related targets in FY 2001	N/A
FY 2000 Proceeded with the development of the next generation coupled ocean-atmosphere climate model, leading to better information for assessing climate change and variability at regional rather than global scales. This next generation model changed grid size from the current 300-500 kilometers on a side to less than 200 kilometers on a side.	Met Goal

Annual Target for FY 2003		Assessment
SC 3-2b	Increase the spatial resolution of the atmospheric and ocean and sea ice submodels to 1.4 degrees (about 150 kilometers) and approximately 0.7 degrees (about 75 kilometers), respectively, for the fully coupled climate model.	Met 100% of the Target
<p>Commentary – Target met. To better understand the factors that determine Earth's climate well enough so that we can predict its future impacts, the Office of Science's Office of Biological and Environmental Research (BER) has been working to develop advanced climate models that can describe and predict the roles of oceans, the atmosphere, sea ice and land masses on climate.</p> <p>BER's Climate Modeling program develops advanced, fully coupled (atmosphere, ocean-sea, ice-land surface) climate models and uses premier supercomputers to simulate and predict climate and climate change, including evaluating uncertainties in climate models due to changes in atmospheric levels of greenhouse gases on decade-to-century time scales.</p> <p>In FY 2003, BER advanced its fully coupled climate model by increasing the spatial resolution of the atmospheric sub model to 1.4 degrees (about 150 kilometers) and increasing the spatial resolution of the ocean and sea ice sub model to approximately 0.7 degrees (about 75 kilometers) resulting in simulation improvements.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Additional Annual Targets from FY 2002-2000		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	Conducted five Intensive Operations Periods (IOPs) on schedule at the Atmospheric Radiation Measurement (ARM) Southern Plains site in Oklahoma. Obtained data from second station on the North Slope of Alaska, and made the third station in the Tropical Western Pacific on Christmas Island operational on schedule and within budget, in accordance with the program plan.	Exceeded Goal
FY 2000	Continued ARM accomplishments by conducting five intensive operations periods at the ARM Southern Great Plains site. Data was obtained from the second station on the North Slope of Alaska. The third station in the Tropical Western Pacific, on Christmas Island, became operational.	Met Goal
	In cooperation with NASA, NSF, USDA/Forest Service, and the Smithsonian Institution, provided quantitative data on the annual exchange of carbon dioxide	Met Goal

between the atmosphere and terrestrial ecosystem from 25 AmeriFlux sites representing major types of ecosystem and land uses in North and Central America. Provided data on the effect of environmental factors, such as climate variation, on the net sequestration or release of carbon dioxide and the role of biophysical processes controlling the net exchange.

Program Goal	Assessment
SC 4-1 Build leading research programs in the scientific disciplines encompassed by the Basic Energy Science (BES) mission areas and provide world-class, peer-reviewed research results cognizant of DOE needs as well as the needs of the broad scientific community.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 4-1a Competitively select and peer review at least 80 percent of all new research projects, using guidelines defined in 10 CFR 605 for the university projects, and similar guidelines established by BES for the laboratory projects.	Met 100% of the Target
Commentary – Target met and exceeded. All new research projects were peer reviewed using guidelines defined in 10 CFR 605 for the university projects and similar guidelines established by BES for the laboratory projects.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Competitively select and peer review at least 80% of all new research projects, and evaluate approximately 30% of ongoing projects using guidelines defined in 10 CFR 605 for the university projects and similar guidelines established by BES for the laboratory projects.</p> <p>Result: Ninety-eight percent of all FY 2002 new BES-supported research projects were competitively selected and peer reviewed, and approximately one-third of ongoing projects received peer review during FY 2002.</p>	Met Goal
FY 2001	Used expert advisory committees and rigorous peer review committees to ascertain that the research performed by investigators in universities and DOE laboratories is focused and outstanding. An additional indicator of the success of our scientific research was recognition through the awards received by our researchers and by the broader scientific community.	Met Goal
FY 2000	Maintained the high quality and relevance of DOE's science research effort as evaluated by annual peer reviews and advisory committees.	Met Goal
	Continued Partnerships for Academic-Industrial Research, in which peer reviewed grants are awarded to university researchers for	Met Goal

fundamental, high-risk work jointly defined by academic and industrial research partners.

Annual Target for FY 2003		Assessment
SC 4-1b	Competitively evaluate approximately 30 percent of ongoing projects using guidelines defined in 10 CFR 605 for the university projects, and similar guidelines established by BES for the laboratory projects.	Met 100% of the Target
Commentary – Target met. All university grants scheduled for renewal were peer reviewed, as were approximately 30% of the laboratory projects.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 4-1c	As part of the continuing, high-level review of the management processes and the quality, relevance, and the national and international leadership of BES programs, review the materials sciences and engineering activities using a BESAC chartered Committee of Visitors.	Met 100% of the Target
Commentary – A BESAC chartered Committee of Visitors (COV) reviewed the BES Materials Sciences and Engineering activities in FY 2003 as planned. The COV presented its report to BESAC which was accepted. The COV concluded that the research being funded by the programs under reviews is of exceptional high quality.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 4-1e	Through a BESAC-chartered workshop on “Basic Research Needs to Assure a Secure Energy Future,” evaluate future basic research directions appropriate for all activities of the BES program.	Met 100% of the Target
<p>Commentary – The BESAC-chartered workshop on "Basic Research Needs To Assure A Energy Future" was held on October 21-25, 2002. Over 100 scientists and engineers from academia, industry, and federal laboratories and agencies participated in the workshop. The workshop Sub panel presented its report to BESAC on May 28; BESAC accepted the report. The results of the workshop are a compilation of 37 proposed research directions, falling into 10 general research areas, all of which are multidisciplinary in nature. The workshop report is available at: http://www.sc.doe.gov/bes/BESAC/reports.html.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
<p>SC 4-2 Enable U.S. leadership in nanoscale science, allowing the atom-by-atom design of materials and integrated systems of nanostructured components having new and improved properties for applications as diverse as high-efficiency solar cells and better catalysts for the production of fuels.</p> <p>Commentary – The main elements of the nanoscale research program in FY 2003 focused on the establishment of five Nanoscale research Centers and the support for nanoscale research in targeted areas addressing forefront science and Departmental mission needs.</p>	Met 100% of the Goal

Annual Target for FY 2003		Assessment
SC 4-2a	Begin construction of one NSRC, meeting the cost and timetables within 10 percent of the baselines given in the construction project data sheets for Project Number 03-R-312.	Met 100% of the Target
<p>Commentary – CD-3 was approved in February 2003 for the ORNL NSRC, and ground-breaking occurred in July 2003. The Nano Science Research Centers (NSRCs) were conceived in FY 1999 within the context of the National Science and Technology Council (NSTC) Interagency Working Group on Nanoscale Science, Engineering, and Technology as part of the DOE contribution to the National Nanotechnology Initiative. Planning for the NSRC has included substantial participation by the research community through a series of widely advertised and heavily attended workshops attracting a total of about 2,000 researchers.</p> <p>The NSRCs will be user facilities for the synthesis, processing, fabrication, and analysis of materials at the nanoscale. They are designed to enable the nanoscale revolution by collocating multiple research disciplines, multiple techniques, and a wide variety of state-of-the-art instrumentation in a single building. The NSRCs are designed to promote rapid advances in the various areas of nanoscale science and technology. Construction on the first NSRC, the Center for Nanophase Material Sciences at Oak Ridge National Laboratory, began in July 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Begin engineering and design of three Nanoscale Science Research Centers (NSRC). Complete six percent of total Project Engineering Design (PED) at LBNL, 60% at ORNL, and 24% at SNL by the end of FY 2002. Result: Project Engineering Design was begun on three Nanoscale Science Research Centers (NSRC). PED funding was obligated to LBNL (6% complete), ORNL (60% complete), and SNL (24% complete).	Met Goal
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 4-2b	Conduct project engineering design (PED) activities to establish construction baselines on the two other NSRCs.	Met 100% of the Target
<p>Commentary – Target met. Project engineering design (PED) activities proceeded on schedule for the LBNL, SNL/LANL, and ORNL NSRCs. CD-2 for the LBNL NSRC was accomplished on July 22, 2003, and for the SNL/LANL NRSC on August 20, 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 4-2c	Establish the instrument suites and identify fabrication capabilities for the new NSRC-based upon user community, based on input at national workshops held in late FY 2001 and FY 2002	Met 100% of the Target
<p>Commentary – Target met. Initial instrument suites have been baselined for the ORNL, LBNL, and SNL/LANL NSRCs and have been identified for the ANL and BNL NRSCs. Fabrication capabilities have been identified successfully for all suites.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Additional Annual Targets from FY 2002-2000		Assessment
FY 2002	Target: Award 40 grants to universities and six projects at DOE laboratories in selected areas of nanoscale science, engineering, and technology. Results: Forty-six new grants were awarded to universities. Twelve projects at DOE laboratories were initiated in selected areas of nanoscale science, engineering, and technology.	Met Goal
FY 2001	Initiated 76 grants to universities (from 417 grant applications) and 12 projects at DOE laboratories (from 46 Field Work Proposals) in selected areas of nanoscale science, engineering, and technology.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
<p>SC 4-3 Develop advanced research instruments for x-ray diffraction, scattering, and imaging to provide diverse communities of researchers with the tools necessary for exploration and discovery in materials sciences and engineering, chemistry, earth and geosciences, and biology.</p> <p>Commentary – No Commentary</p>	Met 100% of the Goal

Annual Target for FY 2003	Assessment
<p>SC 4-3a Select and begin upgrade/fabrication of at least two instruments at the Basic Energy Sciences (BES) synchrotron light sources, based on peer review of submitted proposals, to keep the facilities at the forefront of science. Because the lifetime of an instrument is about 7-10 years, this addresses the need to renew instruments on a regular basis.</p> <p>Commentary – Target met. Upgrade and fabrication activities were initiated on the micro-diffraction beamline at NSLS and on the inelastic scattering beamline at ALS.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003	Assessment
<p>SC 4-3b Establish collaborative, national Research & Development programs for common needs at the BES synchrotron light sources, e.g., for detectors and other components.</p> <p>Commentary – Target met. The BESAC Subcommittee Workshop Report on 20-Year Basic Energy Sciences Facilities Roadmap strongly recommended that timely investment in upgrades of the four DOE light sources be made. During FY 2003, representatives from the BES synchrotron light sources identified as a common need for their facilities upgrade an R&D program for new state-of-the-art insertion devices, including consideration of superconducting technology. A collaborative proposal will be submitted to BES for evaluation.</p>	Met 100% of the Target

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 5-1 Build leading research programs in the focused disciplines of applied mathematics, computer science, and network and collaboratory research important to national and energy security to spur revolutionary advances in the use of high performance computers and networks.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 5-1a Complete the definitive analysis of the advantages and issues associated with lightweight kernel operating systems, rather than full kernels for the compute nodes of extreme-scale scientific computers, resolving a critical issue for the future of high performance computers in the U.S.	Met 100% of the Target
Commentary – Target met. Definitive analysis and comparisons of the Light Weight Kernal vs. the full Linux kernal on Intel IA-32 platform and document impact on selected application performance was completed as planned.	

Related Annual Targets (FY 2002 – FY 2000)	Assessment
FY 2002 Target: Complete the development of the Cougar lightweight kernel for clusters of Alpha processor-based computers, and begin the assessment of scalability and performance for selected applications. Result: The Cougar lightweight kernel operating system for the Accelerated Strategic Computing Initiative (ASCI) Red machine has been ported to CPlant at Sandia National Laboratory. This port takes maximum advantage of the open-source Linux kernel and enables a direct comparison of application performance on the CPlant system under the normal Linux full-kernel operating system and the ported microkernel, thus completing the lightweight kernel operating system. Applications assessment and scalability has begun.	Met Goal
FY 2001 Initiated project to understand the advantages and issues associated with lightweight kernel operating systems rather than full kernels for the compute nodes of extreme-scale scientific computers.	Met Goal
FY 2000 There were no related targets in FY 2000	N/A

Additional Annual Targets from FY 2002-2000		
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	Develop advanced computing capabilities, computational algorithms, models, methods, libraries, and advanced visualization and data management systems to enable new computing applications to science.	Met Goal

Program Goal	Assessment
<p>SC 5-2 Create the Mathematical and Computing Systems Software and the High Performance Computing Facilities that enable Scientific Simulation and Modeling Codes to take full advantage of the extraordinary capabilities of terascale computers, and the Collaboratory Software Infrastructure to enable geographically-separated scientists to effectively work together as a team as well as provide electronic access to both facilities and data.</p> <p>Commentary – The Advanced Scientific Computing Research program focuses on discovering, developing, and deploying advanced scientific computing and communication tools, and operation of high-performance computing and network facilities that researchers need to analyze, model, simulate, and predict the behavior of complex natural and engineered systems.</p>	<p>Met at or above 80%, but less than 100% of the Goal</p>

Annual Target for FY 2003	Assessment
<p>SC 5-2a Begin installation of next generation NERSC computer, NERSC-4, that will at least double the capability available to solve leading edge scientific problems.</p> <p>Commentary – Target was partially met. The National Energy Research Scientific Computing Center (NERSC), a component of the Office of Science, provides computer resources for about 2,000 scientists in universities, DOE laboratories, Federal agencies, and U.S. companies.</p> <p>The upgrade planned in FY 2003 for NERSC was to buy a next generation computer system (to be called NERSC-4) to double computing capability and enable NERSC to maintain its role as one of the Nation's premier unclassified computing centers, a critical element for success of many Office of Science research programs. However, the procurement efforts for a next generation computer system could not produce a cost-effective independent new machine that could be installed in FY 2003.</p> <p>However, the need to double capacity in FY 2003 needed to be addressed. Therefore, the current NERSC-3 system was doubled in size. The result is the NERSC-3E, a 10 teraflop per second (10 trillion calculations per second) machine with double the peak performance and capacity of the NERSC-3, making it the most powerful computer for unclassified research in the United States. The NERSC-3E was in full operation as of March 2003, meeting performance expectations at a lower cost and shorter schedule than the planned NERSC-4 approach.</p>	<p>Met less than 80% of the Target</p>

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	Continued to fabricate, assemble, and operate premier supercomputer and networking facilities that serve researchers at national laboratories, universities and within industry, enabling understanding of complex problems and effective integration of geographically distributed teams in national collaborations.	Met Goal

Annual Target for FY 2003		Assessment
SC 5-2b	Initiate at least five competitively selected interdisciplinary research teams to provide computational science and applied mathematics advances that will accelerate biological discovery in microbial systems or develop the next generation of computational tools required for nanoscale science, based on peer review of submitted proposals.	Met 100% of the Target
<p>Commentary – Calls for proposals were prepared and issued and interdisciplinary research peer reviews completed as planned.</p> <p>World leadership in science requires high-performance computational and networking resources. Recent dramatic advances in scientific computation by researchers and computer companies underscore the importance of strengthening our position in computational sciences in strategic areas.</p> <p>The Scientific Discovery through Advanced Computing (SciDaC) program is a set of coordinated investments across all Office of Science mission areas with goal of achieving breakthrough scientific advances via computer simulation that are impossible using theoretical or laboratory studies alone. The power of computers and networks is increasing exponentially. Advances in high-end computing technology, together with innovative algorithms and software, are being exploited as intrinsic tools for scientific discovery. SciDaC has also pioneered an effective new model of multidisciplinary collaboration among discipline-specific scientists, computer scientist, computational scientists, and mathematicians. The product of this collaborative approach will be a new generation of scientific simulation codes that can productively exploit terascale computing and networking resources.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Achieve operation of the IBM-SP computer at 5.0 teraflop “peak” performance. These computational resources will be integrated by a common high performance file storage system that facilitates interdisciplinary collaborations. Transfer the users with largest data processing and storage needs to the IBM-SP from the previous generation Cray T3E. Result: Phase two of the National Energy Research Scientific Computing Center-3 (NERSC) system was brought online at the end of FY 2001. This 3,328-processor IBM-SP system achieved a peak performance of five teraflop/second during FY 2002, NERSC has increased disk cache and added Fibre Channel disks. Archive storage was also expanded. Approximately 400 Cray T3E users are being transferred to the higher performance computing IBM-SP.	Met Goal
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 6-1 Develop the basis for a reliable capability to predict the behavior of magnetically confined plasma, and use the advances in the Tokamak concept to enable the start of the burning plasma physics phase of the U.S. fusion sciences program.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 6-1a Complete installation of internal coils for feedback control of plasma instabilities on DIII-D.	Met 100% of the Target
Commentary – Target met. The installation of DIII-D internal coils was completed in the third quarter of FY 2003.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Use recently upgraded plasma microwave heating system and new sensors on DIII-D to study feedback stabilization of disruptive plasma oscillations. Result: These studies were successfully carried out in DIII-D in FY 2002, using the recently acquired electron cyclotron heating (ECH) power. Up to 4.0 MW of ECH power was deposited in selected regions of the plasma, using steerable ECH antennae, to drive additional plasma current. These currents alter the conditions for detrimental plasma oscillations and stabilize them to avoid disruptions. The stabilization of different modes of oscillations has been demonstrated, raising the performance of the plasma and extending its pulse length.	Met Goal
FY 2001	Completed, by June 2001, the 6 MW power upgrade of the DIII-D microwave system, and initiated experiments with it to control and sustain plasma current profiles, with the goal of maintaining improved confinement of plasma energy for longer periods of time. Plan of Action: While the completion of the upgrade to the DIII-D microwave power was delayed until March 2002 without additional cost to allow implementation of an innovative fix to a longstanding technical problem, the program obtained successful initial results on controlling and sustaining the current profiles with a lower level of available power. This fix will improve future operations.	Below Expectations
FY 2000	Maintained high scientific quality in the Energy Research Program, as judged by the Program Advisory Committees. Operated the DIII-D Tokamak facility to test the feasibility of using increased radio frequency heating power, and improved power exhaust capabilities to extend the pulse length of advanced operating modes—a requirement for future fusion energy sources.	Met Goal Met Goal

Annual Target for FY 2003		Assessment
SC 6-1b	Conduct a first set of experiments demonstrating the effectiveness of these coils in controlling plasma instabilities, and compare the results with theoretical predictions	Met 100% of the Target
<p>Commentary – The initial set of experiments on the DII-D internal coils was successfully completed demonstrating its effectiveness. A report of results was prepared and issued in FY 2003.</p> <p>The global stability of the fusion plasma is a concern because the cost of fusion energy production is sensitive to this factor. Understanding and developing techniques to maximize and maintain adequate plasma stability is the long-term focus of fusion research.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 6-1c	Produce high temperature plasmas with five megawatts of Ion Cyclotron Radio Frequency (ICRF) power for pulse lengths of 0.5 seconds in the Alcator C-Mod. Assess the stability and confinement properties of these plasmas, which would have collisionalities in the same range as that expected for the burning plasma regime.	Met 100% of the Target
<p>Commentary – Target met. Five MW of Ion Cyclotron Radio Frequency power, with a 0.5 second pulse length, was produced and assessed. Results were obtained from these experiments and analyzed. A report was prepared and submitted to DOE in September 2003.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	Operated a novel magnetic fusion confinement device, the National Spherical Torus Experiment, with 0.5 mega-ampere plasma currents approaching 0.5-second pulse lengths, and one mega-ampere currents for shorter pulses.	Met Goal

Additional Annual Targets from FY 2002-2000		Assessment
FY 2002	Target: Successfully demonstrate innovative techniques for initiating and maintaining current in a spherical torus. Result: The National Spherical Torus Experiment (NSTX) has initiated plasma using Coaxial Helicity Injection and maintained high ratios of plasma pressure to applied magnetic pressure for increased durations by raising current drive while reducing induction. A number of these plasmas were operating in the High-Confinement-Mode (H-mode) lasting essentially the flattop duration of the plasma current.	Met Goal
FY 2001	Improved nonlinear magnetohydrodynamics codes to be capable of computing the effect of realistic resistive walls and plasma rotation on advanced Tokamak pressure limits.	Met Goal
FY 2000	Made operational three innovative concept exploration experiments in fusion science—the LSX field-reversed configuration and the flow-through Z pinch, both at the University of Washington, and the Pegasus quasi-spherical toroidal plasma at the University of Wisconsin—providing basic scientific understanding of relevant concept phenomena.	Met Goal

Program Goal	Assessment
SC 6-2 Develop the cutting edge technologies that enable Fusion Energy Sciences (FES) research facilities to achieve their scientific goals and investigate innovations needed to create attractive visions of designs and technologies for fusion energy systems.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003		Assessment
SC 6-2a	Complete testing of the High-Power Prototype advanced ion-cyclotron radio frequency antenna that will be used at the Joint European Torus (JET).	Met 100% of the Target
Commentary – Target met. Testing of the High-Power Prototype advanced ion-cyclotron radio frequency antenna was completed. The final report was completed as planned.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Complete design and fabrication of the High-Power Prototype advanced ion-cyclotron radio frequency antenna that will be used at the Joint European Torus (JET). Result: All design work has been completed, and the fabrication and assembly of the components that ORNL is responsible for was ready for completion as scheduled by September 2002. However, the delivery of the capacitors that are to be provided by JET could not meet the same schedule and is expected to be delayed by about two months until November 2002.	Mixed Results
Plan of Action: Since the delayed capacitors provide structural support for the inner conductor of the transmission line of the antenna,		

	the whole assembly will not be completed as scheduled. Shipment of the capacitors is expected in November 2002, with final assembly to be completed by the end of December 2002.	
FY 2001	Evaluated first physics results from the innovative Electric Tokamak at University of California Los Angeles (UCLA) to study fast plasma rotation and associated radial electric fields due to radio frequency-drive, in order to enhance plasma pressure in sustained, stable plasmas.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 6-2b	Complete preliminary experimental and modeling investigations of nano-scale thermodynamic, mechanical, and creep-rupture properties of nano-composited ferritic steels.	Met 100% of the Target
Commentary – Target met. The goal of investigating key properties of nano-composited ferritic steels was successfully achieved as planned.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Complete measurements and analysis of thermal creep of Vanadium Alloy (V-4Cr-4Ti) in vacuum and lithium environments; determine controlling creep mechanisms and access operating temperature limits. Result: Measurements in vacuum completed in early FY 2002 and measurements in lithium were completed in FY 2002. Data analysis provided the basis for formulating models of mechanisms responsible for deformation by thermal creep at high temperatures. Advancement was made in fundamental understanding of impacts from impurities, especially oxygen, on deformation rates.	Met Goal
FY 2001	Initiated a new U.S.-Japan collaborative program for research on enabling technologies, materials, and engineering science for an attractive fusion energy source.	Met Goal
	Completed the DOE-Japan Atomic Energy Research Institute (JAERI) collaboration on fusion plasma chamber exhaust processing in the Tritium Systems Test Assembly (TSTA) facility at Los Alamos National Laboratories (LANL).	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Additional Annual Targets from FY 2002-2000		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	By June 2001, entered into a new NSF/DOE Partnership in Basic Plasma Science and Engineering to provide continuity after the existing agreement	Not Met

	ended, and initiated a new element of the U.S.-Japan collaborative program by the end of FY 2001.	
	Plan of Action: The NSF partnership agreement that permits joint solicitation of basic plasma science studies was signed in February 2002. The new element of the U.S.–Japan program was initiated as planned.	
FY 2000	There were no related targets in FY 2000.	N/A

Program Goal	Assessment
SC 7-1A Manage High Energy Physics (HEP) facility operations to the highest standards of performance, using merit evaluation with independent peer review. Meet U.S. commitments to the accelerator and detector components of the Large Hadron Collider (LHC) facility now under construction.	Met 100% of the Goal
Commentary – The commitments (see targets SC7-1A1a, SC7-1A1b, and SC7-1A1c) were met.	

Program Goal	Assessment
SC 7-1A1 Meet the completion targets for the U.S. portion of the LHC project.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003		Assessment
SC 7-1A1a	Meet the completion targets for the U.S. portion of the LHC project - CMS 78 percent.	Met 100% of the Target
Commentary – The LHC project-CMS achieved its annual target of 78% completed at the end of the third quarter of FY 2003. By the close of FY 2003, the project was 81% completed.		
SC 7-1A1b	Meet the completion targets for the U.S. portion of the LHC project - ATLAS 74 percent.	Met 100% of the Target
Commentary – The LHC project-ATLAS achieved its annual target of 74% completed at the end of the third quarter, FY 2003. By close of FY 2003, this project was 81% completed.		
SC 7-1A1c	Meet the completion targets for the U.S. portion of the LHC project - Accelerator 86 percent.	Met 100% of the Target
Commentary – The LHC project-Accelerator achieved its annual target of 86% completed at the end of third quarter, FY 2003. By close of FY 2003, the project was 88% completed.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Meet the completion targets for the U.S. portion of the LHC project.	Mixed Results

	<ul style="list-style-type: none"> • Compact Muon Solenoid (CMS) - 77% • Argonne Tandem Linac Accelerator System (ATLAS) - 72% • Accelerator - 85% <p>Result: CMS completion percentage was 71% in FY 2002; ATLAS was 73%; and the accelerator was 80%. Some elements of the U.S. LHC effort are inextricably linked to the LHC completion schedule, which was slipped by one year by CERN; therefore completion of certain components of the U.S. program was necessarily delayed. Also, CMS recently assumed additional scope, which had the effect of lowering the percentage completed. Nevertheless, CMS is on schedule to fulfill its obligations on time and within planned cost. With regard to the accelerator, there is sufficient schedule float that it will be finished on time.</p> <p>Plan Of Action: The U.S. projects are revising their schedules to match the new LHC completion schedule, and carefully worked out the end-game strategies. Revisions to the project completion date and funding profile have been developed and the Baseline Change Proposal has been submitted. ESAAB is scheduled for November 19 and FY 2004 budget request reflects these revised plans, which will result in 97% of project completion by end of FY 2005 and remaining 3% by end of FY 2008.</p>	
FY 2001	Met on time and within budget the scheduled U.S. DOE commitments to the international Large Hadron Collider (LHC) project, as reflected in the latest international agreement and corresponding plan. The completion figures for the U.S. portion of the LHC project were: <ul style="list-style-type: none"> • CMS 61% • ATLAS 61% • Accelerator 68% 	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-1A2	Maintain and operate HEP forefront scientific facilities such that unscheduled downtime is less than 20 percent of the total scheduled operating time.	Met 100% of the Target
Commentary – Unscheduled downtime of the HEP scientific facilities was less than 20%.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain and operate HEP forefront scientific facilities such that unscheduled downtime is less than 20 percent of the total scheduled operating time. Result: Tevatron unscheduled downtime during FY 2002 was reported at 18%. SLAC B-factory unscheduled downtime was only 14%.	Met Goal

FY 2001	HEP scientific facilities were scheduled and operated such that unscheduled downtime averaged about 20% of scheduled operating time.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 7-1B Perform the research and development needed to support the operation and upgrade of existing HEP facilities and to provide the tools and technology to develop new forefront facilities.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 7-1B1 Demonstrate operation of advanced design accelerating structure for the Next Linear Collider (NLC) at 70 MV/m.	Met 100% of the Target
Commentary – Operation of the advanced design accelerating structure for the Next Linear Collider (NLC) was successfully demonstrated at 70MV/m.	

Related Annual Targets (FY 2002 – FY 2000)	Assessment
FY 2002 Target: Complete construction of Linac Test Area at BNL for detailed targeting & capture studies. Result: Construction of Linac Test Area, which has enabled research and development tests has been completed. (Met Goal) Target: Demonstrate operation of 11.4 GHz accelerating structure for an NLC at 75 MV/m without significant structural damage. Result: The 11.4 GHz accelerating structures to be used in the Next Linear Collider (NLC) operated successfully at an accelerating gradient of 75 Mv/m without significant structural damage from voltage breakdown in the body of the accelerating structure.	Met Goal
FY 2001 Demonstrated that 50 MV/m accelerating gradients in 11.4 GHz Next Linear Collider (NLC) accelerating structures are sustainable without significant structure damage.	Met Goal
At BNL, successfully completed initial tests of carbon and mercury jet targets for the next generation of proton-driven accelerators.	Met Goal
FY 2000 There were no related targets in FY 2000	N/A

Annual Target for FY 2003	Assessment
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SC 7-1C	Conduct, using outside experts, a review (1) of the operations and performance of the HEP–supported accelerator facility at Fermilab (Tevatron) to identify opportunities to optimize efficiency and performance.	Met 100% of the Target
Commentary – The review of the Fermilab Tevatron Accelerator was conducted as planned in FY 2003 using outside experts, and a report was issued and is available on the Office of High Energy Physics website at http://doe.hep.net/general-reports.htm		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 7-2 Manage all Nuclear Physics (NP) facility operations and construction to the highest standards of overall performance, using merit evaluation with independent peer review.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003		Assessment
SC 7-2a	Maintain and operate NP scientific user facilities so that the unscheduled operational downtime will be kept to less than 20 percent, on average, of total scheduled operating time.	Met 100% of the Target
Commentary – The average unscheduled operational downtime for our six user facilities through the fourth quarter FY 2003 is less than 12 percent of the total scheduled operating time.		
The user facilities reported the following performance:		
KEY		
Facility: (Research Hours/Unscheduled Downtime Hours/% Downtime)		
ATLAS: 6221/256/4%;		
HRIBF: 4723/251/5%;		
88" Cyclotron: 4443/190/4%;		
TJNAF: 5401/929/15%;		
MIT-Bates: 3922/1101/22%;		
RHIC: 3441/975/22%		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain and operate NP scientific user facilities so that the unscheduled operational downtime will be less than 20%, on average, of total scheduled operating time. Result: All facilities operated in FY 2002 with unscheduled operational downtime at less than 20%. Through the fourth quarter, the user facilities reported the following	Met Goal

	performance: Facility/Research Hours/Unscheduled Downtime Hours/% Downtime ATLAS / 5486/275/5%; HRIBF/4248/720/15%; 88" Cyclotron/4478/364/5%; TJNAF/3961/528/12%; MIT-Bates/5558/774/12%; RHIC/2109/469/18%.	
FY 2001	Maintained and operated NP scientific user facilities so that the unscheduled operational downtime was 15%, on average, of total scheduled operating time.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-2b	Upgrade the RHIC cryogenics system to eliminate seal gas compressor single point failure.	Met 100% of the Target
Commentary – All components of the Cryogenics Systems Upgrade have been installed and tested. The project is complete.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Complete Helium Storage addition and liquid nitrogen standby cooling system at RHIC, leading to better cost effectiveness (\$0.5M savings) and operational efficiency (10% increase). Result: The Helium Storage addition was completed in FY 2002. The nitrogen standby cooling system, which is 95% completed, has been delayed six months due primarily to the vendor's delivery schedule. Plan of Action: Although completion of the nitrogen standby cooling system is delayed, it will not impact the RHIC operating cycle, which will occur in FY 2003 as planned. Overall, the RHIC project is on track and being reviewed quarterly to ensure project is completed as scheduled.	Mixed Results
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-2c	Meet the cost and schedule milestones for construction of facilities and Major Items of Equipment within 10 percent of baseline estimates. Specifically, complete the Solenoidal Tracker at RHIC (STAR) Electro-Magnetic Calorimeter (EMCAL).	Met 100% of the Target

Commentary – All modules of the EMCAL project were completed and delivered to Brookhaven National Laboratory according to schedule.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Meet the cost and schedule milestones for construction of facilities and Major Items of Equipment (MIE) within 10% of baseline estimates. Complete the Pioneering High Energy Nuclear Interacting Experiment (PHENIX) Muon Arm Instrumentation. Result: Costs and schedules of MIE are within 10% of baseline estimates. PHENIX MIE was completed this quarter, six months ahead of schedule.	Met Goal
FY 2001	(2) Met the cost and schedule milestones for construction of facilities and Major Items of Equipment within 10% of baseline estimates. Completed the Analysis System for Relativistic Heavy Ion Collider (RHIC) Detectors and RHIC Silicon Vertex Detector on schedule.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 7-3 Manage all Biological & Environmental Research (BER) facility operations and construction to the highest standards of overall performance, using merit evaluation with independent peer review.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 7-3a Keep within 10 percent of cost and schedule milestones for upgrades and construction of scientific user facilities.	Met 100% of the Target
Commentary – Development of SIBYLS beamline at the Advanced Light Source was completed and commissioned as planned for in FY 2003.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Keep within 10% of cost and schedule milestones for upgrades and construction of scientific user facilities; begin acceptance testing of the new high performance computer at the Environmental Molecular Sciences Laboratory (EMSL) at the Pacific Northwest National Laboratory (PNNL); continue construction of the CCFG at ORNL. Result: The first phase of the new high performance computer for the Environmental Molecular Sciences Laboratory (EMSL) was delivered on time in early May 2002. Several benchmark tests have been performed on the 64-processor prototype system, and the system has performed as well as or better than expected. Construction of the Laboratory for Comparative and Functional Genomics at Oak Ridge National Laboratory remains on schedule and on target.	Met Goal

FY 2001	(1) Upgrades and construction of scientific user facilities were kept within 10% of cost and schedule milestones. Commissioning of the protein crystallography Structural Biology User Station at the Los Alamos National Laboratory was initiated, and construction of the Center for Comparative and Functional Genomics at Oak Ridge National Laboratory was initiated.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-3b	Begin operation of the new high performance computer at the EMSL at the PNNL	Met 100% of the Target
<p>Commentary – On August 26, 2003, the Department of Energy's Pacific Northwest National Laboratory (PNNL) announced that the EMSL's new supercomputer was now operating and available to users. The new system is one of many leading edge capabilities within the EMSL. Based on peak performance, the 11.8 teraflop system was the fifth fastest system in the world. The new supercomputer is the world's fastest supercomputer based on the Linux operating system.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-3c	Complete construction of the Laboratory for Comparative and Functional Genomics (LCFG) at ORNL.	Met 100% of the Target
<p>Commentary – Construction of the Laboratory for Comparative and Functional Genomics at the Oak Ridge National Laboratory was successfully completed on time and within budget.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-3d	Maintain and operate the BER scientific user facilities so the unscheduled downtime on average is less than 10 percent of the total scheduled operating time.	Met 100% of the Target
<p>Commentary – The EMSL deployed its EMSL Resource Scheduling (ERS) system in a phased approach to inform management of equipment status and availability to accumulate a history of research system usage. The ERS system was deployed on all major instruments in the EMSL in FY 2003. The unscheduled downtime has been successfully tracked at less than 10% on average.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain and operate the BER scientific user facilities so the unscheduled downtime averages less than 10% of the total scheduled operating time. Result: The Environmental Molecular Sciences Laboratory (EMSL) has been open to users 24 hours, with over 100 unique instruments that receive mixed usage (high performance computer, nuclear magnetic resonance spectrometers, <i>etc.</i>)	Met Goal
FY 2001	The BER scientific user facilities were maintained and operated so the unscheduled downtime averaged less than 10% of the total scheduled operating time.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 7-4A Manage Basic Energy Sciences (BES) facility operations and construction to the highest standards of overall performance using merit evaluation with independent peer review.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003		Assessment
SC 7-4A1	Complete the upgrade of the SPEAR 3 storage ring at the SSRL, maintaining cost and schedule within 10 percent of baselines.	Met 100% of the Target
<p>Commentary – Target met. The SPEAR 3 storage ring upgrade project was completed on schedule and within its budget.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Continue upgrades on the major components of the SPEAR 3 storage ring at the Stanford Synchrotron Radiation Laboratory (SSRL), maintaining cost and schedule within 10% of baseline. At the end of FY 2002, the upgrade of SPEAR 3 will be 70% complete. Result: The SPEAR 3 storage ring at the SSRL was on cost and schedule to within 10% of baseline and 71% complete in FY 2002.	Met Goal

FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-4A2	Maintain and operate the BES scientific user facilities so the unscheduled downtime on average is less than 10 percent of the total scheduled operating time. Maintain the cost and schedule milestones within 10 percent for upgrades and construction of scientific user facilities.	Met 100% of the Target
<p>Commentary – BES user facilities have operated and performed according to the annual target. The Basic Energy Science (BES) Program within the Office of Science supports world-class scientific user facilities, providing outstanding capabilities for imaging and characterizing materials of all kinds from metals, alloys, and ceramics to fragile biological samples. BES's synchrotron radiation light sources, the neutron scattering facilities, and the electron beam characterization centers represent the largest and best collection of such facilities supported by a single organization in the world. Annually, 8,000 researchers from universities, national laboratories, and industrial laboratories perform experiments at these facilities.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain and operate the BES scientific user facilities so that unscheduled downtime averages less than 10% of the total scheduled operating time. Maintain the cost and schedule milestones within 10% for upgrades and construction of scientific user facilities. Result: Basic Energy Sciences' seven major user facilities have operated an average 96.1% of their scheduled operating times in FY 2002. In addition, no shutdowns occurred at these major facilities in FY 2002.	Met Goal
FY 2001	Maintained and operated the scientific user facilities so that the unscheduled downtime averaged less than 10% of the total scheduled operating time.	Met Goal
FY 2000	Met the cost and schedule milestones for the upgrade and construction of scientific facilities.	Met Goal

Program Goal	Assessment
SC 7-4B Restore U.S. preeminence in neutron scattering research, instrumentation, and facilities to provide researchers with the tools necessary for the exploration and discovery of advanced materials.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 7-4B1 Continue construction of the Spallation Neutron Source (SNS), meeting the cost and timetables within 10 percent of the baselines given in the construction project data sheet, Project Number 99-E-334. At the end of FY 2003, construction of the SNS will be 61 percent complete.	Met 100% of the Target
Commentary – Target met. SNS construction is on schedule and within budget. At the end of FY 2003, construction of the SNS was 68% complete.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Continue construction of the SNS, meeting the cost and timetables within 10% of the baselines in the construction project data sheet, Project Number 99-E-334. At the end of FY 2002, construction of the SNS will be 47% complete. Result: The Spallation Neutron Source construction, project number 99-E-334 was 51% completed, on cost/schedule and within 10% of the baseline construction project data sheet.	Met Goal
FY 2001	Met the cost and schedule milestones for upgrade and construction of scientific user facilities, including the construction of the SNS.	Met Goal
FY 2000	Continued construction of the SNS, meeting cost and timetables as contained in the Critical Decision II agreement, to provide beams of neutrons used to probe and understand the physical, chemical, and biological properties of materials at an atomic level leading to better fibers, plastics, catalysts, and magnets and improvements in pharmaceuticals, computing equipment, and electric motors.	Met Goal

Annual Target for FY 2003	Assessment
SC 7-4B2 Select and begin fabrication of one additional instrument for the Spallation Neutron Source (SNS).	Met 100% of the Target
Commentary – Target met. BES selected five new instruments for SNS and in May 2003 initiated a MIE project for fabrication of these instruments.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Select and begin fabrication of one additional instrument for the Spallation Neutron Source (SNS). Result: With two new grants selected and awarded, fabrication of instrumentation at the Spallation Neutron Source has begun.	Met Goal
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-4B3	Select and begin upgrade/ fabrication of one instrument each at the High Flux Isotope Reactor and the Manuel Lujan, Jr. Neutron Scattering Center. Commitment at the Lujan Center is conditional upon Los Alamos Neutron Science Center (LANSC) demonstrating reliable operations, as determined by a Basic Energy Science Advisory Committee (BESAC) review to be conducted in FY 2003.	Met 100% of the Target
Commentary – Target met. HB1, HB1A, and HB3 have been upgraded and put into operation HFIR. A SERGIS (Spin Echo Reflection Grazing Incidence Spectrometer) was selected for LANSCE and fabrication was initiated.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	Continued fabrication of instrumentation for the short-pulse spallation source at the Manual Lujan Jr. Neutron Scattering Center at the Los Alamos Neutron Science Center (LANSC).	Met Goal

Program Goal	Assessment
SC 7-5 Provide advanced scientific user facilities where scientific excellence is validated by external review; average operational downtime does not exceed 10 percent of schedule; construction and upgrades are within 10 percent of schedule and budget; and facility technology research and development programs meet their goals.	Met 100% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003		Assessment
SC 7-5a	Maintain and operate facilities, including NERSC and ESnet, so the unscheduled downtime on average is less than 10 percent of the total scheduled operating time.	Met 100% of the Target

Commentary – Target met. In all of FY 2003 unscheduled downtime for NERSC and ESnet was less than 10 % of total scheduled operating time.

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Maintain and operate facilities, including NERSC and ESnet, so the unscheduled downtime on average is less than 10% of the total scheduled operating time. Result: The National Energy Research Scientific Computing Center (NERSC) has reached an unscheduled downtime on the high performance computing capabilities of the T3E of 0.54%, and on the IBM-SP, 1.26%. ESnet has successfully achieved an unscheduled downtime of only 0.2%.	Met Goal
FY 2001	Operated facilities, including the National Energy Research Scientific Computing Center (NERSC) and ESnet, within budget while meeting user needs and satisfying overall SC program requirements. NERSC delivered 3.6 teraflop capability at the end of FY 2001 to support DOE’s science mission.	Exceeded Goal
	Expanded and increased access to published and preprinted scientific and technical information via cost-effective, specialized information retrieval systems, resulting in a 25% increase in users served.	Exceeded Goal
FY 2000	Met 75% of the requirements of computer facilities and networks users.	Nearly Met Goal
	Plan of Action: In the case of both ESnet and NERSC, the demand for computing capabilities far exceed what current resources are able to provide. To address this problem NERSC will continue using peer reviews and focus on the Office of Science’s highest priority research to allocate limited resources to achieve optimum scientific output from the facility. ESnet employs a number of innovative network management and contracting procedures to deliver the maximum amount of service for the minimum cost, as previously noted by external review committees.	
	Increased the availability of peer-reviewed scientific journal literature, preprints, and reports to DOE and the public by 25% over FY 1999 through collaborations with publishers, data compilers, exchange partners, and R&D programs using Web-based mechanisms.	Exceeded Goal

Annual Target for FY 2003		Assessment
SC 7-5b	Complete the review of ASCR high performance computing facilities by the Advanced Scientific Computing Advisory Committee (ASCAC) and implement action plans to respond to recommendations.	Met 100% of the Target
Commentary – Target met. The integrated allocation process, a recommendation from the ASCAC review, will be used to implement the NERSC allocations for FY 2004.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Deliver preliminary report on Advanced Scientific Computing Advisory Committee (ASCAC) review of ASCR high performance computing facilities. Result: The ASCAC preliminary report on the ASCR high-performance computing facilities was received in May 2002 at the Advisory Committee meeting. The scope of the facilities assessment activity was broadened by the Director of Science to include addressing the Japanese challenge to U.S. supercomputing primacy represented by the Earth Simulator.	Met Goal
FY 2001	(2) Initiated the review of ASCR high performance computing facilities by the ASCAC.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Program Goal	Assessment
SC 7-6 Manage all Fusion Energy Sciences (FES) facility operations and construction to the highest standards of overall performance, using merit evaluation and independent peer review.	Met less than 80% of the Goal
Commentary – No Commentary Provided	

Annual Target for FY 2003	Assessment
SC 7-6a Keep deviations in cost and schedule for upgrades and construction of scientific user facilities within 10 percent of approved baselines.	Met 100% of the Target
Commentary – This Target was met. The ECH Upgrade (DIII-D) and LH (C-MOD) microwave heating and current drive projects were completed in FY 2003.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Keep deviations in cost and schedule for upgrades and construction of scientific user facilities within 10% of approved baselines. Result: The Lower Hybrid (LH) Heating System upgrade for the Alcator C-Mod facility at Massachusetts Institute of Technology is in its third year of fabrication and remains on cost and on schedule. The upgrade is scheduled to be complete in FY 2003. The Electron Cyclotron Heating (ECH) upgrade for the DIII-D facility at General Atomics is well over 80% complete and within cost. Two of the three heating tubes have performed to specification; however, the third tube developed a leak and is being repaired. Plan of Action: Although repairs have to be made to the Electron Cyclotron Heating (ECH) tube, the final tests to the ECH are still on track and scheduled to be completed in FY 2003.	Mixed Results
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003	Assessment
SC 7-6b Keep deviations in weeks of operation for each major facility within 10 percent of the approved plan.	Met less than 80% of the Target
Commentary – The DIII-D achieved 14 weeks of operation, one more week than planned. The C-MOD exceeded 13 weeks by two days. The NSTX operated only 4 weeks because of its magnet coil failure. Plan of Action: Improved coil design was thoroughly reviewed by an external committee and repairs are in progress. NSTX will resume operation in early Calendar Year 2004.	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Keep deviations in weeks of operation for each major facility within 10% of the approved plan. Result: The National Spherical Torus Experiment (NSTX) at the Princeton Plasma Physics Laboratory achieved its 12 planned weeks of operation in FY 2002, and is currently undergoing minor modifications in preparation for operation in FY 2003. The Alcator C-Mod facility at Massachusetts Institute of Technology is currently in operation after having completed a major 9-month inspection of the integrity of the Tokamak core of the facility. The core was found to be satisfactory and the facility achieved its target of eight weeks of operation. The DIII-D facility at General Atomics achieved 12 of its planned 14 weeks of operation in FY 2002, and therefore did not achieve the target of operating at least 90% of the planned weeks. The facility was forced to shut down earlier than planned due to a water leak.</p> <p>Plan of Action: To maintain the overall progress of the DIII-D research program, the decision was made to fix the leak and then proceed with other planned modifications of the facility in order to be ready to operate the facility at an optimum schedule in FY 2003, pending approval of the FY 2003 budget request. The leak has been repaired.</p>	Mixed Results
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Annual Target for FY 2003		Assessment
SC 7-6c	Complete the National Compact Stellarator Experiment (NCSX) Conceptual Design, and begin the Preliminary Design.	Met 100% of the Target
<p>Commentary – Target met. The National Compact Stellarator Experiment (NCSX) conceptual design was completed and the Preliminary Design is progressing as planned.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Successfully complete within cost and in a safe manner all TFTR decontamination and decommissioning activities. Result: The Tokamak Fusion Test Reactor (TFTR) Decontamination and Decommissioning (D&D) project at Princeton Plasma Physics Laboratory was completed this year on cost and schedule.</p>	Met Goal
FY 2001	There were no related targets in FY 2001	N/A
FY 2000	There were no related targets in FY 2000	N/A

Additional Annual Targets from FY 2002-2000		Assessment
FY 2002	There were no related targets in FY 2002	N/A
FY 2001	Achieved planned cost and schedule performance for dismantling, packaging, and offsite shipping of the Tokamak Fusion Test Reactor (TFTR) systems.	Met Goal
	Kept deviations in cost and schedule for upgrades and construction of scientific user facilities within 10% of approved baselines.	Met Goal
	Kept deviations in weeks of operation for each major facility within ten percent of the approved plan.	Met Goal
FY 2000	There were no related targets in FY 2000	N/A

Goal 6: Environmental Management

Summary of FY 2003 Annual Performance

9	Targets Met	6	Targets Not Met
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FY 2002 Net Costs (in thousands):

Goal 6 Costs: \$5,992,000

FY 2003 Net Costs (in thousands):

Goal 6 Costs: \$6,127,000

Refer to Page 303 of the Financial Results section for a consolidated statement of net cost by Goal

Annual Performance Goals and Targets FY 2000 – FY 2003 Results

General Goal Six: ENVIRONMENTAL MANAGEMENT: Accelerate cleanup of nuclear weapons manufacturing and testing sites, completing cleanup of 108 contaminated sites by 2025.

Program Goal	Assessment
<p>EM 1-1: By FY 2006, complete cleanup at as many of the Department's 37 sites remaining at the end of FY 2004 as possible. Continue cleanup at the remaining sites, including the five largest sites, scheduled for completion in the post-2006 timeframe.</p> <p>Commentary – The FY03 targets were exceeded for release site completion, nuclear facilities completion, radioactive facilities completion, and industrial facilities completion, demonstrating EM's progress toward site cleanup. For the geographic site remediation measure, Maxey Flats has been completed. The measure is red in coloration because remediation at the Salmon Site has been completed but state approval is still pending. Regulator approval, which is required for close-out of the Salmon Site, is expected in FY2004. This delay is not expected to have an impact on the goal of completing geographic site cleanup.</p>	<p>Met at or above 80%, but less than 100% of the Goal</p>

Annual Targets for FY 2003	Assessment
<p>EM 1-1a Complete remediation at two additional geographic sites, the Maxey Flats Disposal Site in Kentucky and the Salmon Site in Mississippi, increasing the total completed to 77 of the 114 geographic sites.</p> <p>Commentary – Salmon Site remediation complete; awaiting state approval. EM's criterion for close-out is regulator approval. The site is currently working with the State of Mississippi in receiving its approval of the cleanup and transfer of the site to the appropriate party. State approval is expected in FY 2004, upon which the site will be considered complete. The delay in this measure is not expected to impact the completion of this activity.</p>	<p>Met less than 80% of the Target</p>

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target – Complete remediation at one additional geographic site, the Weldon Spring Site in Missouri. Result – The EM program completed one geographic site in FY 2002, the Weldon Spring Site in Missouri	Met Goal
FY 2001	Target – Complete remediation at three geographic sites Result – Met Goal	Met Goal
FY 2000	Target – Complete remediation at two geographic sites Result – Met Goal	Met Goal

Annual Targets for FY 2003		Assessment
EM 1-1b	Complete 193 release sites.	Met 100% of the Target
Commentary – FY 2003 target exceeded by 35%. Completion of release sites, discrete areas of contamination at a site, is a good indicator of a site progress toward risk reduction and closure.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target – Complete 113 release sites. Result – At the end of FY 2002, 129 release sites had been completed	Met Goal
FY 2001	Target – Complete 196 release sites. Result – Completed 186 release sites	Nearly Met Goal
FY 2000	Target – Complete 252 release site cleanups Result – Completed 208 release site cleanups	Nearly Met Goal

Annual Targets for FY 2003		Assessment
EM 1-1c	Complete two nuclear facilities.	Met 100% of the Target
Commentary – FY03 target exceeded by 100%; nuclear facility completions is an excellent indicator of EM's progress toward footprint reduction and site cleanup.		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Annual Targets for FY 2003 (Continued)		Assessment
EM 1-1d	Complete 10 radioactive facilities.	Met 100% of the Target
<p>Commentary – FY03 target exceeded by 140%. In exceeding the target, completion of radioactive facilities demonstrates success in reducing the EM footprint.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Annual Targets for FY 2003 (Continued)		Assessment
EM 1-1e	Complete 43 industrial facilities.	Met 100% of the Target
<p>Commentary – Target exceeded by 149%; industrial completions is an excellent indicator of EM's progress towards site cleanup.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Additional Annual Targets from FY 2002-2000		Assessment
FY 2002	<p>Target: Conduct a top-to-bottom review of the Environmental Management program to ensure a proper and clear focus of the mission programmatic goals and objectives. Result: A Top-to-Bottom Review of the Environmental Management (EM) program was completed February 2002. As a result of the review, EM has developed an aggressive plan of action to change how EM approaches its cleanup mission. The EM program is now focusing on accelerating risk reduction and cleanup. EM is currently evaluating, on a site-by-site basis, its performance metrics and milestones to align with the program's new accelerated risk reduction and cleanup approach. EM intends to develop new performance measures, which will more clearly capture the overall progress towards completion of the end-point objective of site cleanup. By developing performance measures which will objectively and accurately measure overall program performance, EM will be in a position to</p>	Met Goal

	<p>meaningfully monitor and report overall progress towards acceleration risk reduction and cleanup.</p> <p>Target: Update EM Infrastructure Restoration Plan to support 10 year facilities and infrastructure planning. Result: Following completion of the Top-to-Bottom Review in February 2002, EM is focusing its resources on accelerating risk reduction and site closure. To do so requires a focus on its core mission – cleanup and closure while addressing the utility of those business practices that do not support the EM mission. As a result of the Review, EM sites have developed, and will continue to refine, Performance Management Plans (PMPs) that define cleanup end states and strategies to reach those end states. The PMPs address facilities and infrastructure planning, not only for the next 10 years, but over the project’s life-cycle as well.</p>	Met Goal
	<p>Target: Complete action addressing safety and health issues at Paducah from 1990 forward (Phase 1). Result: The Paducah Corrective Action Plan from EH investigations and all 77 actions have been closed and verified as of April 3, 2002. Three of the 76 corrective actions targeted to be completed in FY 01 were not completed. The three outstanding actions were completed in FY 02.</p>	Met Goal
	<p>Target: Complete 42 facility decommissioning projects. Result: At the end of FY 2002, 136 facility decommissionings were completed.</p>	Met Goal
	<p>Target: Deactivate 30 facilities. Result: At the end of FY 2002, 36 facilities were deactivated.</p>	Met Goal
FY 2001	<p>Completed actions addressing safety and health issues at Paducah from 1990 forward (Phase I).</p>	Met Goal
	<p>Complete 28 facility decommissioning.</p>	Met Goal
	<p>Deactivated 20 facilities.</p>	Exceeded Goal
FY 2000	<p>Monitored field activities and participate in reviews at Savannah River Operations Office to ensure adherence to project costs and schedules.</p>	Met Goal
	<p>Completed 82 facility decommissionings.</p>	Nearly Met Goal
	<p>Plan of Action: Completed 77 of the 82 facility decommissioning.</p>	
	<p>Deactivated 30 facilities.</p>	Met Goal

Program Goal	Assessment
EM 1-2: Safely and expeditiously dispose of waste generated during past and current DOE activities. Continue shipment of transuranic (TRU) waste for disposal at the Waste Isolation Pilot Plant (WIPP).	Met less than 80% of the Goal
<p>Commentary – Due primarily to performance efficiencies experienced by Rocky Flats, Richland, and Savannah River, EM exceeded the FY03 target for shipping TRU waste and disposal of LLW/MLLW. Exceeding the target is an important indicator of the program's progress towards accelerating risk reduction and site closure.</p> <p>However, for the elimination of liquid waste, closing liquid waste tanks, and packaging high level waste for final disposition, the FY03 targets were not met. Delays in the elimination of liquid waste and closing the tanks were caused primarily by the Waste Incidental to Reprocessing (WIR) litigation. The Department is pursuing legislative action that will address the legal authority to dispose of decontaminated salt waste as low level waste. If efforts are successful, it will be possible to make up for delay in FY03 and there will be no impact on the goal of disposing of waste generated. If not, then the lifecycle target will not likely be met, and there would be significant cost and schedule impacts to the EM program.</p> <p>For high level waste packaging, despite fewer than 130 canisters being produced in FY 2003, SR actions taken during the year resulted in increased canister waste loading. As a result, more waste was disposed per canister than originally anticipated. Therefore, this measure will not impact the goal of waste disposal.</p>	

Annual Targets for FY 2003	Assessment
EM 1-2a Eliminate 700,000 gallons of liquid waste.	Met less than 80% of the Target
<p>Commentary – Due to Waste Incidental to Reprocessing (WIR) litigation, along with technical difficulties in retrieving waste and upgrading facilities for disposal, SRS has not been able to begin this work. The Department is pursuing legislative action that will address the legal authority to dispose of decontaminated salt waste as low level waste. In addition, the Department is working closely with the State of South Carolina to obtain waste disposal permits. However, the first step in obtaining these permits would be the resolution of WIR. If the legislative and permitting activities are successful, it will be possible to make up for delay in FY03 and to achieve the lifecycle target. If not, then the lifecycle target will not likely be met, and there would be significant cost impacts to the EM program.</p>	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Annual Targets for FY 2003		Assessment
EM 1-2b	Close one liquid waste tank.	Met less than 80% of the Target
<p>Commentary – This metric was delayed due to litigation of the WIR issue. ID has directed the INEEL contractor to stop efforts to close the first two tanks in FY03 and FY04, and to instead focus efforts on accelerated cleaning of additional emptied HLW tanks to prepare them for eventual closure. This re-direction will result in missing these HLW tank closure metrics for FY03 and F04. If the legislative activities are successful, it will be possible to make up for delay in FY03 and to achieve the lifecycle target. If not, then the lifecycle target will not likely be met, and there would be significant cost and schedule impacts to the EM program.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Annual Targets for FY 2003		Assessment
EM 1-2c	Package 130 containers of high-level waste for final disposition.	Met at or above 80%, but less than 100% of the Target
<p>Commentary – Despite fewer than 130 canisters being produced in FY 2003, SR actions taken during the year resulted in increased canister waste loading. As a result, the 115 canisters produced had a waste loading of 143 equivalent canisters. While this results in more waste per canister, the time to fill a canister has increased due to operational difficulties that resulted from the waste loading increase. A task team has been formed to optimize melter operations, and improved canister production times have been achieved in the past two weeks. Further improvements are anticipated. With optimized waste loading, SR expects to dispose of more waste in fewer containers. The EM program is considering altering the lifecycle number of canisters through the baseline change process. Therefore, FY03 performance will not impact the completion of this activity.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target – Produce 205 canisters of HLW</p> <p>Results – At the end of FY 2002, 173 canisters of HLW were produced.</p> <p>Plan of Action: Only 84% of the FY 2002 target was met due to the Defense Waste Processing Facility (DWPF) at the Savannah River Site not meeting its target. The processing facility did not achieve the expected canister production in FY 2002 because of melter degradation. This degradation was due to one of the four dome heaters</p>	Not Met

	<p>failing and continued melter pour spout problems. The melter far-exceeded its design life of two and one half years by operating for over eight years. Though there are no specific plans to make up the FY 2002 shortfall in FY 2003, it is envisioned that the SRS Performance Management Plan will address any near-term canister production shortfalls.</p>	
FY 2001	Target – Produce 225 canisters of HLW	Met Goal
FY 2000	Target – Produce 200 canisters of HLW at the Defense Waste Processing Facility (DWPF) at Savannah River Site and five canisters of HLW at the West Valley Demonstration Project.	Exceeded Goal

Annual Targets for FY 2003 (Continued)		Assessment
EM 1-2d	Ship 4,135 cubic meters of transuranic waste to WIPP.	Met 100% of the Target
<p>Commentary – FY 2003 target exceeded by 54% (6,372 vs. 4135 cubic meters) due primarily to performance efficiencies experienced by Rocky Flats, Richland, and Savannah River. Exceeding the target is an important indicator of the program's progress towards accelerating risk reduction and site closure.</p> <p>The Mound Closure Project completed shipping all its legacy transuranic waste (266 cu.m.) to the Savannah River Site for interim storage. Completion of this activity frees up "T" Building (where the waste was stored), for decontamination and decommissioning.</p> <p>Battelle Columbus completed three shipments of TRU waste to Hanford for interim storage. This shipment was the first remote-handled TRU waste shipment from Battelle in thirteen years.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target– Ship 4,709 cubic meters of TRU waste to WIPP for disposal.</p> <p>Result– At the end of FY 2002, 5,122 cubic meters of TRU waste were shipped to WIPP for disposal.</p>	Met Goal
FY 2001	<p>Target– Ship 2,425 cubic meters of TRU waste to WIPP for disposal.</p> <p>Plan of Action: There are a number of reasons that shipments to the (WIPP) were lower than the FY 2001 goal. These reasons include: number of “stand downs” INEEL to correct conduct of operations problems and equipment outage; delays caused by the New Mexico Environment Department (NMED) by reclassifying and approval of certain permit modifications that affected waste characterization activities at sites; delays by NMED in approving site certification audits; and delays in shipments due to weather. INEEL and RFETS have requested an increase in the number of scheduled shipments per week to WIPP to help DOE keep commitments under the Idaho Settlement Agreement and meeting the 2006 Rocky Flats Site Closure</p>	Below Expectations

	target. The WIPP program is seeking additional FY 2002 funding to increase the weekly number of shipments received at WIPP.	
FY 2000	<p>Target– Ship 1,200 cubic meters of TRU waste to WIPP for disposal.</p> <p>Plan of Action: From October 1, 1999 to November 8, 1999, only non-RCRA waste was received at WIPP while awaiting approval of the RCRA permit. Due to the wording of the permit, the waste sites had to realign their programs to conform with the requirements. Receipt of waste resumed on March 10, 2000, after a four-month delay.</p> <p>Implemented the permit requirements in parallel with the court challenge and begin Mixed TRU waste disposal operations at WIPP in FY 2000.</p>	<p>Below Expectations</p> <p>Met Goal</p>

Annual Targets for FY 2003 (Continued)		Assessment
EM 1-2e	Dispose of approximately 78,388 cubic meters of low-level waste/mixed low-level waste.	Met 100% of the Target
<p>Commentary – Target exceeded by 52% due primarily to performance efficiencies experienced by Rocky Flats, Richland, and Savannah River. Exceeding the target is an excellent indicator of the intensity of cleanup activities which are taking place across the complex.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Dispose of approximately 8,446 cubic meters of MLLW.</p> <p>Result: At the end of FY 2002, 8,435 cubic meters of MLLW were disposed of.</p> <p>Plan of Action: Given the fact that 99.9% of the target was met, no plan of action was deemed necessary. It is expected that the FY 2003 target will be met.</p>	Mixed Results
	<p>Target: Treat approximately 2,765 cubic meters of MLLW. Result: At the end of FY 2002, 2,694 cubic meters of MLLW were treated.</p> <p>Plan of Action: Given the fact that 97% of the target was met, no plan of action was deemed necessary. It is expected that the FY 2003 target will be met.</p>	Mixed Results
	<p>Target: Dispose of approximately 76,655 cubic meters of LLW.</p> <p>Result: At the end of FY 2002, 97,374 cubic meters of LLW were disposed.</p>	Met Goal
FY 2001	<p>Dispose of approximately 8,271 cubic meters of MLLW.</p> <p>Plan of Action: The target was missed due to the unavailability of the prerequisite number of treatment facilities and temporary interruptions</p>	Below Expectations

	<p>in shipping activities. A key treatment facility has now come on line and shipping interruptions have been resolved. This combination of corrective actions should enable the department to meet its FY 2002 target.</p> <p>Treat approximately 4,814 cubic meters of MLLW.</p> <p>Plan of Action: Target was missed because commercial treatment facilities expected to be operating did not come on line. One of the commercial treatment facilities has now come on line and will support meeting EM's FY 2002 target.</p> <p>Dispose of approximately 47,908 cubic meters of LLW.</p>	<p>Nearly Met Goal</p>
FY 2000	<p>Disposed of 10,000 cubic meters of MLLW.</p> <p>Treated 6,973 cubic meters of MLLW.</p> <p>Disposed of 40,000 cubic meters of LLW.</p>	<p>Exceeded Goal</p> <p>Exceeded Goal</p> <p>Met Goal</p> <p>Exceeded Goal</p>

Program Goal	Assessment
<p>EM 1-3: Stabilize nuclear material and spent nuclear fuel by producing safer chemical and/or physical forms of the material, and reduce the level of potential risk to personnel from radiation exposure and to the environment from contamination.</p> <p>Commentary – EM exceeded the FY03 targets for packaging plutonium, plutonium or uranium residues, and depleted and other uranium. Exceeding these targets reduces the inventory of high-risk nuclear materials by preparing it for long-term storage, and demonstrates EM's progress towards environmental, safety, and security risk reduction.</p> <p>However, the targets were not met for packaging enriched uranium and packaging spent nuclear fuel. For spent nuclear fuel, the delay will be eliminated by the end of FY04, and will have no impact on the goal of stabilizing nuclear material and spent nuclear fuel. For enriched uranium, the overall shortfall will gradually be reduced and will be eliminated by the second quarter of FY06. Since this measure is scheduled for completion at the end of FY08 and the FY03 shortfall will be eliminated by FY06, the FY03 delays are expected to have no impact on the completion of this activity or on the achievement of the overall goal of stabilizing nuclear material and spent nuclear fuel.</p>	<p>Met at or above 80%, but less than 100% of the Goal</p>

Annual Targets for FY 2003	Assessment
<p>EM 1-3a Package 2,836 containers of plutonium metals or oxide for long-term storage.</p> <p>Commentary – FY 2003 target was exceeded by 8%. In exceeding the target, thereby reducing the inventory of high-risk nuclear materials by preparing it for long-term storage, demonstrates EM's progress towards environmental, safety, and security risk reduction.</p>	<p>Met 100% of the Target</p>

Related Annual Targets (FY 2002 – FY 2000)	Assessment
<p>FY 2002 Target: Stabilize 110 containers of plutonium metals/oxides and 17,225 kilograms bulk of plutonium residues. Result: At the end of FY 2002, 243 containers of plutonium metals/oxides and 18,001 kilograms bulk of plutonium residues were stabilized. Rocky Flats was the main contributor to the EM program not meeting its FY 2001 plutonium residue target. In FY 2002, Rocky Flats completed stabilizing all remaining plutonium residue at the site.</p>	<p>Met Goal</p>
<p>FY 2001 (1) Stabilized 510 containers of plutonium metals/oxides and 29,456 kilograms bulk of plutonium residues.</p> <p>Plan of Action: Richland was the primary contributor to not meeting the stabilization of plutonium metals/oxides target. Start-up of packaging equipment at Richland was delayed by three months due to delivery and installation problems. Operations are on hold to resolve a weld porosity problem with packages. Necessary adjustments to work schedule to be made when weld problem corrected. Main contributor</p>	<p>Below Expectations</p>

	to not meeting the stabilization target for plutonium residues was Rocky Flats; however, all residue stabilization is still planned to be completed at Rocky Flats by the May 2002 DNFSB commitment date.	
FY 2000	Stabilized 400 containers of plutonium metals/oxides, 41,000 kilograms bulk (kg) of plutonium residues, and 130 handling units of other nuclear material in other forms.	Nearly Met Goal
	Plan of Action: Stabilized 29,460 kg bulk of plutonium residues, 574 containers of plutonium metals/oxides, and 224 handling units of other nuclear materials.	

Annual Targets for FY 2003 (Continued)		Assessment
EM 1-3b	Package 283 containers of enriched uranium for long-term storage.	Met less than 80% of the Target
<p>Commentary – Due to shipping issue with the vendor, SRS began shipments late and was not able to make up for the delays. SRS is working to make up for the shortfall. It is forecast that the overall shortfall will gradually be reduced and will be eliminated by the second quarter of FY06. Since this measure is scheduled for completion at the end of FY08 and the FY03 shortfall will be eliminated by FY 2006, the FY 2003 delays are expected to have no impact on the completion of this activity.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Annual Targets for FY 2003 (Continued)		Assessment
EM 1-3c	Package 934 kilograms of plutonium or uranium residues for disposition.	Met 100% of the Target
<p>Commentary – FY 2003 target exceeded by 22%. In completing removal of remaining residues in FY 2003; the Rocky Flats site is on schedule for site closure in FY 2006.</p> <p>At Hanford, all plutonium finishing plant residues were stabilized and packaged, in response to Defense Nuclear Facility Safety Board Recommendation 2000-1. This commitment was completed eight months ahead of schedule.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A

FY 2000	There were no related Targets in FY 2000.	N/A
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Annual Targets for FY 2003 (Continued)		Assessment
EM 1-3d	Package 857 metric tons of heavy metal of spent nuclear fuel for disposition.	Met at or above 80%, but less than 100% of the Target
<p>Commentary – At Hanford, deteriorating fuel at the K-basin led to the need to wash additional canisters and other changes in technical approach which is slowing the process. The contractor has submitted a recovery plan to achieve removal of a total of 2106 MTHM of K-Basin Fuel by July 31, 2004. The 2106 MTHM number includes the FY 03 variance plus the FY 04 goal of 631MTHM. The balance (8 MTHM) of Shippingport fuel should be shipped by end of FY04. Therefore, the variance in FY03 will not have an impact on the completion of this activity.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Move to dry storage 601 metric tons heavy metal (MTHM) of spent nuclear fuel (SNF). Result: At the end of FY 2002, 510 metric tons heavy metal of SNF were moved to dry storage.</p> <p>Plan of Action: Continued equipment and operational problems have significantly reduced the rate of N-Reactor spent nuclear fuel removal from wet storage in the Hanford K-Basin and packaging into Multi-Canister Overpacks for dry storage in the Canister Storage Building. The fuel primary cleaning machine basket failed, shutting down all fuel processing until another basket could be prepared and installed. In addition, a Multi-Canister Overpack failed an integrated leak test. The following corrective actions have been implemented to help increase equipment reliability and efficiency of moving fuel from wet to dry storage: rinse and wash reductions, reduced fuel inspections, equipment improvements and redesign, additional spare parts, pre-planned work packages, and better maintenance outage planning and coordination. Despite these corrective actions, the FY 2002 target of 601 MTHM was not met.</p>	Mixed Results
FY 2001	Moved to dry storage 195 metric tons of heavy metal (MTHM) of spent nuclear fuel (SNF).	Exceeded Goal
FY 2000	<p>Moved to dry storage 35.1 metric tons of heavy metal (MTHM) of spent nuclear fuel (SNF) to dry storage.</p> <p>Plan of Action: Moved approximately three tons of MTHM to dry storage.</p>	Below Expectations

Annual Targets for FY 2003 (Continued)		Assessment
EM 1-3e	Package 1,815 metric tons of depleted and other uranium for disposition.	Met 100% of the Target
<p>Commentary – FY 2003 target exceeded by approximately 151% due to project acceleration at the Savannah River site. In exceeding the target, the stabilization and packaging of the nuclear material enables EM to reduce a major cost driver for the program.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related Targets in FY 2002.	N/A
FY 2001	There were no related Targets in FY 2001.	N/A
FY 2000	There were no related Targets in FY 2000.	N/A

Goal 7: Nuclear Waste

Summary of FY 2003 Annual Performance

2

Targets
Met

2

Targets
Not Met

FY 2002 Net Costs (in thousands):

Goal 7 Costs: \$81,000

FY 2003 Net Costs (in thousands):

Goal 7 Costs: \$95,000

Refer to Page 303 of the Financial Results section for a consolidated statement of net cost by Goal

Annual Performance Goals and Targets FY 2000 – FY 2003 Results

General Goal Seven: Nuclear Waste: License and construct a permanent repository for nuclear waste at Yucca Mountain and begin acceptance of waste by 2010.

Program Goal	Assessment
RW2-1: Obtain a repository construction authorization from the Nuclear Regulatory Commission in 2008.	Met less than 80% of the Goal
<p>Commentary – Although some testing activities were deferred until the first quarter of FY 2004, RW is on track to submit the license application and ultimately receive a construction authorization in 2008. Beginning preliminary design activities in FY 2003 is a key step in this process.</p>	

Annual Targets for FY 2003	Assessment
RW 2-1a Complete additional testing and analyses required to support license application design.	Met less than 80% of the Target
<p>Commentary – The Waste Package Thermal Investigation (WPTI) Test rescheduled for completion in the 4th quarter is expected to be completed in the 1st quarter of FY 2004 because of the actual time and effort required to resolve instrumentation problems and set up the reduced scale WPTI test.</p> <p>Although the additional testing required to support license application design was not 100 percent completed in FY 2003, a work-around was developed to allow the designers to continue their work using a range of values that encompasses the expected test results. The actual results will be used to confirm the assumptions. Therefore, there should be no resultant delay in achieving the program goal of obtaining a construction license from NRC in 2008.</p>	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	Target: Submit a Final Environmental Impact Statement to the President as required by the Nuclear Waste Policy Act (NWPA). Result: The Final Environmental Impact Statement (EIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, was transmitted to the President by the Secretary of Energy on February 14, 2002, as part of the documentation supporting the Yucca Mountain Site Recommendation.	Met Goal
FY 2001	Completed the scientific and technical documents that will provide the technical basis for a possible site recommendation.	Met Goal
FY 2000	Completed public hearings on the Draft Environmental Impact Statement, which was published in August 1999.	Met Goal

Annual Targets for FY 2003		Assessment
RW 2-1b	Complete development of repository conceptual design and request Acquisition Executive approval to start preliminary design, which will be used in the license application.	Met 100% of the Target
<p>Commentary – Approval to begin preliminary design is a significant first step in the process of designing the repository surface and subsurface facilities and the waste package which are important components of the license application.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	There were no related targets in FY 2002.	N/A
FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	Selected the reference design for site recommendation and license application. Plan of Action: The reference design for site recommendation was selected for the preliminary site suitability evaluation, which was used for the statutory hearings on site recommendation. The license application design will be selected after consideration of comments from stakeholders, including oversight bodies, such as the Nuclear Waste Technical Review Board, if the site designation becomes effective.	Mixed Results

Annual Targets for FY 2003		Assessment
RW 2-1c	Complete and issue updated Total System Life Cycle Cost and Fee Adequacy reports in preparation for license application.	Met 100% of the Target
<p>Commentary –The Fee Adequacy Report, based on the Total System Life Cycle Analysis, presents the Department's determination whether the fee paid by utilities into the Nuclear Waste Fund is sufficient to cover the total cost of the Program. This analysis is required by the NWPA to be conducted annually for the Secretary to decide whether an adjustment of the 1 mil per kilowatt hour fee should be considered.</p>		

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Begin development of updated Total System Life Cycle Cost and Fee Adequacy reports. Result: A letter report supplementing the May 2001 Total System Life Cycle Cost Analysis and Fee Adequacy reports was issued in February 2002. In addition, a detailed response to the Independent Cost Estimate Review of OCRWM's 2001 Total System Life Cycle Cost Report was issued. Some deficiencies in estimating methodology were identified and are being corrected. Several other studies and reports that will be used in developing the next Total System Life Cycle Cost Analysis and Fee Adequacy reports were completed.</p>	Met Goal
FY 2001	Completed and issue Total System Life Cycle Cost and Fee Adequacy reports.	Met Goal
FY 2000	Selected the reference natural systems models for site recommendation and license application.	Met Goal

Program Goal	Assessment
RW2-2: Develop the national and Nevada transportation infrastructure to support the anticipated shipment of spent nuclear fuel and high-level radioactive waste to the repository, beginning in 2010.	Met less than 80% of the Goal
<p>Commentary – Although RW did not issue the Strategic Transportation Plan as scheduled in FY 2003; significant planning activities have been completed. The new Director of the transportation program is reviewing the draft plan to assure that it reflects the optimal strategies for success. The plan will be issued in the first quarter of FY 2004 and will not impact the overall schedule for developing the transportation infrastructure.</p>	

Annual Targets for FY 2003	Assessment
RW 2-2b Develop and issue the OCRWM Strategic Transportation Plan.	Met less than 80% of the Target
<p>Commentary – The Director of the National Transportation Program did not assume his position until August 18, 2003. Although his predecessor, serving in an acting capacity, had initiated the transportation strategic planning process and produced a draft Plan, it is reasonable for the permanent Director to conduct an initial survey of the OCRWM transportation program and to modify the draft report to ensure that, based on his expertise and experience, it reflects the optimal strategies for success. The Director has collected the necessary data and established the milestones required to build and operate an effective transportation program. The OCRWM Strategic Transportation Plan will be issued during the 1st quarter of FY 2004.</p> <p>Although the issuance of the OCRWM Strategic Transportation Plan was not completed by the end of FY 2003, its issuance in the 1st quarter of FY 2004 is not a significant delay, and should have no impact on Program goal of developing the transportation infrastructure required to support the anticipated shipment of spent nuclear fuel and high-level radioactive waste to the repository in 2010.</p>	

Related Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Issue Nuclear Waste Policy Act Section 180(c) Notice of Revised Proposed Policy and Procedures for public comment. Result: The Nuclear Waste Policy Act Section 180(c) Notice of Revised Policy and Procedures was drafted and was undergoing Departmental review. However, as a result of this Departmental review, it was decided, in consultation with the Office of General Counsel, that it was not appropriate to issue the notice at this time. There are multiple reasons for this decision:</p> <ol style="list-style-type: none"> 1. The amount of related training States and Native American tribes have already received and continue to receive in response to the September 11, 2001, terrorist attacks. 2. The Nuclear Regulatory Commission and the Department of Transportation are considering revising their regulations to require armed escorts for all spent nuclear fuel shipments. 3. OCRWM will issue a transportation plan for shipments to Yucca Mountain in FY 2003, which will discuss how Section 180(c) of the Nuclear Waste Policy Act will be implemented. 	Not Met

Plan of Action: RW's transportation plan, scheduled for issuance in FY 2003, will address how RW plans to proceed with the implementation of Section 180(c) of the Nuclear Waste Policy Act, and will include opportunities for public comment. This plan will also incorporate any changes resulting from possible revisions of NRC and DOT regulations.

FY 2001	There were no related targets in FY 2001.	N/A
FY 2000	There were no related targets in FY 2000.	N/A

Additional Annual Targets (FY 2002 – FY 2000)		Assessment
FY 2002	<p>Target: Submit a Site Recommendation Report to the President. Result: On February 14, 2002, the Secretary of Energy formally recommended to the President that the Yucca Mountain site in Nevada be developed as the Nation's first geologic repository for spent nuclear fuel and high-level radioactive waste. On February 15, 2002, the President recommended the site to Congress. Both houses of Congress voted to override the Governor of Nevada's veto of the President's recommendation. On July 23, 2002, the President signed House Joint Resolution 87 into law and the site designation took effect.</p>	Met Goal
	<p>Target: Issue draft request for proposals for waste acceptance and transportation services. Result: Since this target was established, RW reassessed its strategy for acquiring the transportation fleet, equipment, and services needed to implement its national transportation program. Risks and technical and schedule uncertainties, which presented problems to implementing the strategy laid out in the Request for Proposal (RFP) issued in 1998, are unlikely to diminish in the foreseeable future. Therefore, RW implemented an alternative strategy to mitigate the impact of these uncertainties and to address issues that have evolved since the original RFP was issued. This strategy entails the issuance of a new statement of work (SOW) rather than a draft RFP. The draft SOW was issued on September 30, 2002, and meets the purpose of the original performance target. The approach contained in the draft SOW addresses the ongoing business, schedule, and operational risks associated with the transportation of spent nuclear fuel and high-level radioactive waste. The draft SOW solicits comments on the acquisition approach and facilitates the issuance of a final RFP in FY 2003, as originally planned.</p>	Met Goal
FY 2001	Conducted statutory hearings in the vicinity of Yucca Mountain to inform the residents that the site is under consideration, and to receive comments regarding a possible site recommendation.	Met Goal
	Updated all process models and conduct a total system performance assessment for use in the site recommendation.	Met Goal
FY 2000	There were no additional targets in FY 2000.	N/A

APPENDIX A
FY 2002 Performance Measures Requiring Status Updates in the FY 2003 Performance and Accountability Report

Page in FY 2002 PAR	Program Strategic Performance Goal	FY 2002 Target	Status of FY 2002 Targets Not Met for the FY 2003 PAR
85	NS1-2	<p>Target: Meet the FY 2002 milestones in the production readiness campaigns to address issues associated with high explosives, materials, and non-nuclear technologies. Result: Baseline changes for on-cost performance for the line item construction of the Tritium Extraction Facility are pending. All other FY 2002 milestones in the production readiness campaigns were met. (MIXED RESULTS) Plan of Action: The plan of action for the Tritium Extraction Facility includes development of a revised baseline for scope and schedule, with subsequent review by NNSA.</p>	<p>Status: A revised baseline of scope and schedule for the Tritium Extraction Facility was completed, and subsequently approved by the Deputy Secretary in February 2003. Action is complete.</p>
89	NS2-1	<p>Target: Perform experiments of prototype, unmanned-aerial-vehicle-based Light Detection and Ranging (LIDAR) systems to detect proliferation. Result: Over 80% complete, however the laser subsystem supplied by an industrial vendor did not meet performance specifications and requires rework. Thus, the full system is incomplete. The remainder of the system tested satisfactorily, but a full system test cannot be rescheduled until the next FY due to availability of the test range. All other subsystems performed in accordance with</p>	<p>Status : Action complete. The laser subsystem contract was cancelled, and a commercial off-the-shelf laser was acquired from a different vendor.</p>

APPENDIX A
FY 2002 Performance Measures Requiring Status Updates in the FY 2003 Performance and Accountability Report

Page in FY 2002 PAR	Program Strategic Performance Goal	FY 2002 Target	Status of FY 2002 Targets Not Met for the FY 2003 PAR
89	NS2-2	<p>expectation. A ground based field test was conducted using a surrogate laser and the performance results corresponded to predicted performance. (MIXED RESULTS) Plan of Action: The laser subsystem is to be reworked by the vendor, and a technical assistance team from the laboratory is to work with the vendor to improve the manufacturing process and design. The reworked laser will undergo subsystem tests before being incorporated into the full system. The UAV test range has been rescheduled for late Spring 2003 (earliest availability) and a full system performance test will be conducted at that time.</p>	<p>Status: All work associated with this effort is on hold, and will not resume until a political solution has been achieved to resolve the current situation with North Korea.</p>

APPENDIX A
FY 2002 Performance Measures Requiring Status Updates in the FY 2003 Performance and Accountability Report

Page in FY 2002 PAR	Program Strategic Performance Goal	FY 2002 Target	Status of FY 2002 Targets Not Met for the FY 2003 PAR
91	NS2-4	<p>Target: Modify the agreement between the Russian Federation and the U.S. to cease the production of weapons-grade plutonium at Seversk and Zheleznogorsk. Result: The modified agreement has been cleared by the U.S. government interagency and is now awaiting formal clearance by the Government of the Russian Federation. It is now anticipated that the agreement will be signed by the Secretary of Energy and the Minister of Atomic Energy of the Russian Federation prior to the end of Calendar Year 2002. (NOT MET) Plan of Action: Complementary and concurrent actions are underway to rapidly implement the program once the necessary agreements and arrangements are concluded and the required authorization and appropriations are passed by Congress.</p>	<p>Status: Completed as of March 12, 2003. At a ceremony in Vienna in March, Secretary Abraham and Minister Rumyantsev signed an agreement that would reduce the threat from weapons of mass destruction by stopping plutonium production at the last three Russian plutonium production reactors. Action complete.</p>
97	SC7-1A	<p>Target: Meet the completion targets for the U.S. portion of the LHC project:</p> <ul style="list-style-type: none"> • Compact Muon Solenoid (CMS) - 77% • Argonne Tandem Linac Accelerator System (ATLAS) - 72% • Accelerator - 85% Result: CMS completion 	<p>Status: The Energy Systems Acquisition Advisory Board meeting was held in November 2002. The completion for U.S. projects in FY 2003 was as follows: CMS 78%, ATLAS 74%, and accelerator 86%. Project is on-track in FY 2003 to achieve these goals (see FY 2003 target SC7-71A).</p>

APPENDIX A
FY 2002 Performance Measures Requiring Status Updates in the FY 2003 Performance and Accountability Report

Page in FY 2002 PAR	Program Strategic Performance Goal	FY 2002 Target	Status of FY 2002 Targets Not Met for the FY 2003 PAR
99	SC2-1	<p>percentage was 71% in FY 2002; ATLAS was 73%; and the accelerator was 80%. Some elements of the U.S. LHC effort are inextricably linked to the LHC completion schedule, which was slipped by one year by CERN; therefore completion of certain components of the U.S. program was necessarily delayed. Also, CMS recently assumed additional scope, which had the effect of lowering the percentage completed. Nevertheless, CMS is on schedule to fulfill its obligations on time and within planned cost. With regard to the accelerator, there is sufficient schedule float that it will be finished on time. (MIXED RESULTS) Plan Of Action: The U.S. projects are revising their schedules to match the new LHC completion schedule, and carefully worked out the end-game strategies. Revisions to the project completion date and funding profile have been developed and the Baseline Change Proposal has been submitted. ESAAB is scheduled for November 19 and FY 2004 budget request reflects these revised plans, which will result in 97% of project completion by end of FY 2005 and remaining 3% by end of FY 2008.</p>	
		<p>Target. As elements of the electron beam program, (a) complete commissioning of the BLAST detector at</p>	<p>Status: The BLAST detector was commissioned in</p>

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100	SC2-2	<p>MIT/Bates and initiate first measurements, and (b) complete fabrication, installation and commissioning of the G0 detector, a joint National Science Foundation-DOE project, at Thomas Jefferson National Accelerator Facility (TJNAF). Result: (a) The commissioning of the BLAST detector is proceeding and commissioning is scheduled for October 31, 2002. (b) The G0 detector has been fabricated and installed at Thomas Jefferson National Accelerator Facility and commissioned. It is ready for beam. (MIXED RESULTS). Plan of Action</p> <p>– None specified.</p>	<p>FY 2003. Action complete.</p>
		<p>Target: Complete Helium Storage addition and liquid nitrogen standby cooling system at RHIC, leading to better cost effectiveness (\$0.5M savings) and operational efficiency (10% increase). Result: The Helium Storage addition was completed in FY 2002. The nitrogen standby cooling system, which is 95% completed, has been delayed six months due primarily to the vendor's delivery schedule. (MIXED RESULTS) Plan of Action: Although completion of the nitrogen standby cooling system is delayed, it will not impact the RHIC operating cycle, which will occur in FY 2003 as planned. Overall, the RHIC project is on track and being reviewed quarterly to ensure project is completed as scheduled.</p>	<p>Status: The nitrogen standby cooling system was completed before the end of the FY 2003 RHIC operating cycle, in time for when it was needed.</p>

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102	SC3-1	<p>Target: By the end of FY 2002, the DOE JGI will complete the high quality DNA sequencing of human chromosomes 16 and 19 and produce six billion base pairs of DNA sequence from model organisms (e.g., mouse, Fugu, and Ciona) to help understand the human genome as part of the Human Genome Program.</p> <p>Result: JGI has completed the high quality sequencing of Human Chromosome 19, approximately 92% of Human Chromosome 16, and 97% of Human Chromosome 5. The JGI has also produced seven billion bases of sequences completing the draft sequencing of Fugu (the pufferfish) and Ciona (the sea squirt) as its contribution to the Human Genome Program. Our current assessment is that both Human Chromosomes 16 and 5 will be completed by the end of calendar year 2002. (NOT MET) Plan of Action: Although DOE JGI was more productive in FY 2002 than anticipated, completion of chromosome 16 was delayed two months to support an accelerated sequencing completion date for all chromosomes by end of calendar year 2002 that was imposed by the International Human Genome Program (IHGP) during FY 2002. The deadline for finishing the Human Genome was pushed forward by one year as well. Chromosomes 5 and 16 will be completed to the international standard by December.</p>	<p>Status: The sequencing of Chromosomes 5, 16 and 19 has been completed. The International Human Genome Project announced on April 15, 2003 that the entire human genome had been sequenced to a higher level and to higher quality standards than had originally been proposed, and that the project has been finished at a lower total cost (10% less) than originally estimated.</p>
103	SC3-2	<p>Target: Develop and test a fully coupled atmosphere-ocean-land-sea-ice climate model that has twice the spatial resolution of coupled models available in FY 2000 as part of the Climate Modeling and Prediction</p>	<p>Status: This is an ongoing activity that was tracked in FY 2003 under Program Goal SC3-2b. In FY 2003 the Plan of Action from FY 2002 was</p>

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		<p>research. Support multi-disciplinary teams of scientists at multiple institutions using DOE supercomputers to perform model simulations, diagnostics and testing. Result: The new coupled model was released in May 2002, with an average resolution of 280 km in the atmosphere and 60 km in the ocean. The previous version had resolutions of 200 km and 200 km, respectively. An 800-year equilibrium climate simulation was executed at the National Energy Research Supercomputer Center. (MIXED RESULTS) Plan of Action: Testing is underway using atmospheric configurations of 140 km, 70 km, and 35 km. A fully tested version of the coupled model with 140 km atmospheric resolution is over 80% complete and will be ready by the end of December 2002.</p>	<p>revised, to reflect the end of the FY 2003 testing related to a fully coupled climate model which would begin and would include an increase in the spatial resolution of the atmospheric, ocean, and sea ice sub-models.</p>
111	SC6-2	<p>Target: Complete design and fabrication of the High-Power Prototype advanced ion-cyclotron radio frequency antenna that will be used at the Joint European Torus (JET). Result: All design work has been completed, and the fabrication and assembly of the components that ORNL is responsible for was ready for completion as scheduled by September 2002. However, the delivery of the capacitors that are to be provided by JET could not meet the same schedule and is expected to be delayed by about two months until November 2002. (MIXED RESULTS) Plan of Action: Since the delayed capacitors provide structural support for the inner conductor of the transmission line of the antenna,</p>	<p>Status: Fabrication of the antenna was completed during the first quarter of FY 2003. Action complete.</p>

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111	SC7-6	<p>the whole assembly will not be completed as scheduled. Shipment of the capacitors is expected in November 2002, with final assembly to be completed by the end of December 2002.</p> <p>Target: Keep deviations in weeks of operation for each major facility within 10% of the approved plan. Result: The National Spherical Torus Experiment (NSTX) at the Princeton Plasma Physics Laboratory achieved its 12 planned weeks of operation in FY 2002, and is currently undergoing minor modifications in preparation for operation in FY 2003. The Alcator C-Mod facility at Massachusetts Institute of Technology is currently in operation after having completed a major 9-month inspection of the integrity of the Tokamak core of the facility. The core was found to be satisfactory and the facility achieved its target of eight weeks of operation. The DIII-D facility at General Atomics achieved 12 of its planned 14 weeks of operation in FY 2002, and therefore did not achieve the target of operating at least 90% of the planned weeks. The facility was forced to shut down earlier than planned due to a water leak. (MIXED RESULTS) Plan of Action: To maintain the overall progress of the DIII-D research program, the decision was made to fix the leak and then proceed with other planned modifications of the facility in order to be ready to operate the facility at an optimum schedule in FY 2003, pending approval of the FY 2003 budget</p>	<p>Status: DIII-D repairs were completed at the end of FY 2002, and DIII-D successfully re-started in FY 2003. Action complete.</p>

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112	SC7-6	<p>request. The leak has been repaired.</p> <p>Target: Keep deviations in cost and schedule for upgrades and construction of scientific user facilities within 10% of approved baselines. Result: The Lower Hybrid (LH) Heating System upgrade for the Alcator C-Mod facility at Massachusetts Institute of Technology is in its third year of fabrication and remains on cost and on schedule. The upgrade is scheduled to be complete in FY 2003. The Electron Cyclotron Heating (ECH) upgrade for the DIII-D facility at General Atomics is well over 80% complete and within cost. Two of the three heating tubes have performed to specification; however, the third tube developed a leak and is being repaired. (MIXED RESULTS) Plan of Action: Although repairs have to be made to the Electron Cyclotron Heating (ECH) tube, the final tests to the ECH are still on track and scheduled to be completed in FY 2003.</p>	<p>Status: The DIII-D ECH system tube upgrade was completed during the third quarter of FY 2003. Action complete.</p>
114	SC8-1	<p>Target: Prepare a 5-Year Workforce Restructuring Plan. Recruit for all scientific and technical positions via the automated DOE Job Line to reach a more diverse candidate pool and decrease the time to fill positions. Implement a simplified position classification process/system to reduce administrative burdens and</p>	<p>Status : The roles, responsibilities, accountabilities, and authorities for all major SC elements have been redefined to eliminate management layers, enhance program execution and increase managerial accountability. It is anticipated that the newly proposed structure, including organizational alignment and</p>

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		<p>processing times. Result: The 5-Year Workforce Restructuring Plan is being incorporated into the Office of Science (SC) Restructuring Project to be completed on or by December 31, 2002. All recruit actions for scientific and technical positions are now advertised via the automated DOE Jobs Online, thus reducing the time it takes to fill Office of Science Headquarters positions. Continuous process improvements are being made to more effectively and quickly evaluate applicant qualifications by using the DOE's automated applicant referral System. The internal process for developing and approving all new position descriptions in the Office of Science has been simplified, thus reducing administrative burdens and processing times for position classification. (MIXED RESULTS) Plan of Action: Phase 1 of the SC Restructuring Project is estimated to reach completion by December 31, 2002. As part of this effort, statements of roles, responsibilities, accountabilities, and authorities will be approved for major SC elements; management systems will be inventoried and prioritized for reengineering; system owners will be identified; appropriate memoranda of understandings will signed; the new SC structure, including organizational alignment and reporting relationships, will be fully defined and approved; SC leadership will be assessed; and appointments will be made to critical positions in the new management structure.</p>	<p>reporting relationships, will be concurred upon by external SC elements, approved by the Secretary of Energy, and implemented in FY 2004.</p>

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114	SC8-1	<p>Target: Improve and integrate performance planning and measures between budget documents and DOE performance plans, and conduct six pilot retrospective and/or prospective studies to examine the societal impact of SC research. Result: Integration of performance planning and measures between budget documents and performance plans has progressed through a Basic Energy Sciences Advisory Committee comprehensive review of performance measures and actions that followed two SC initiated interagency workshops on integrating the OMB R&D Investment Criteria, and SC completion of the OMB PART (On-going). In addition, Phase 2 of the Foresighting Study was completed, and Phase 3 began to explore the global challenges over the next 25 years that may affect future science and technology management and policy. (MIXED RESULTS) Plan of Action: Five of the six multi-year studies have been started and are currently being conducted as planned. Because of the general DOE reduction in Office of Science funding, the remaining studies have been planned for FY 2004.</p>	<p>Status : Because of the general DOE reduction in the Office of Science funding in FY 2003, these activities were not performed by the Office of Science as targeted for in FY 2002, and thus are no longer tracked. Integration of performance planning, measurement and evaluation are being achieved via the Office of Science implementation of the President’s Management Agenda.</p>
119	ER1-2	<p>Target: Complete two showcase demonstrations of advanced energy efficient technologies at industry sites. Result: One showcase has been completed at Augusta Newsprint in Georgia. The second showcase, “The Texas Technology</p>	<p>Response: One showcase was completed at Augusta Newsprint in Georgia in FY 2002. The second showcase, “The Texas Technology Showcase,” was held in Houston March 17th-19th, with a focus on chemicals-and petroleum refining</p>

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		<p>Showcase," will focus on chemicals and petroleum refining industries and will be broadened to include sessions on other EERE technologies, including wind, Clean Cities, FreedomCAR, cogeneration/CHP, bioenergy, and hydrogen fuel cells. The showcase was held March 17-19th, 2003, in Houston, Texas, in conjunction with five participating companies and over ten corporate or organizational sponsors. Given the expanded breadth of this new approach, the outcome is anticipated to be much greater in terms of energy savings, since many EERE technologies will be involved. Principal second showcase direct goals have been completed, including plant-wide energy efficiency evaluations and staff training in using best practices tools. The event has been postponed to add value to the industry, sites, and DOE investment by broadening content and participation. (NOT MET) Plan of Action: The Office of Industrial Technologies in conjunction with other EERE programs, states and EERE Regional Offices has examined and planned broadening this successful approach to technology demonstration to include other EERE technologies that can impact the industrial sector, including building technologies that account for over 10% of industrial energy use as well as distributed energy and</p>	<p>industries. The showcase was broadened to include sessions on other EERE technologies, including wind, Clean Cities, FreedomCAR, cogeneration/CHP, bioenergy, and hydrogen fuel cells. Featured were technologies in use at seven host companies: Calpine, Chevron Phillips Chemical Company, the Dow Chemical Company, Exxon Mobil, Merisol USA, Rohm and Haas Texas, and Valero Energy Corporation. Eleven regional, state, and local organizations also sponsored the event. Technical sessions, information booths, and plant tours provided information on innovative, energy-efficiency technologies, several of which emerged from collaborative research and development partnerships cost-shared by the Energy Department. Many of the featured technologies reduce emissions of nitrogen oxides, which are of particular concern in the Houston-Galveston area as precursors to ozone formation.</p> <p>Action Completed: The Texas Technology 2003 Showcase was held in Houston, Texas March 17 – 19, 2003.</p>

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121	ER1-3	<p>renewable energy technologies. The showcase is scheduled for March 17-19, 2003.</p> <p>Target: Fabricate a sport utility vehicle chassis component using carbon fiber in a low cost molding process that is suitable for high volume production. Result: Substantial progress was made toward fabricating a sport utility vehicle chassis component using carbon fiber, in a low cost molding process suitable for high volume production. A critical molding machine breakdown and its repairs have resulted in this target completion being deferred to January 2003. The delay will not affect achieving the long-term goal. (NOT MET) Plan of Action: The machine has been repaired (this diagnosis, design and reconstruction set back the schedule three months). The project is scheduled to be completed by January 2003.</p>	<p>Status: This project remains in the planning mode; after initial delays in this project caused by mechanical equipment failure, a key tooling company declared bankruptcy, and subsequently alternative test facilities and equipment requiring long lead times to schedule have been difficult to attain. A suitable (more stable) molding is currently being sought by the technical project manager. Within three months of placing a purchase with a molding company, glass fiber composite skid plate will then be tested and the final report completed. The delay in completing this project does not significantly affect the considerable progress being made in the overall composite materials research activity.</p>
121	ER1-3	<p>Target: Develop a prototype yeast capable of fermenting multiple biomass-derived sugars to</p>	<p>Status: In mid-2003, EE awarded a contract to Cargill Dow for a multi-year, cost-shared R&D</p>

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		<p>meet cost goals for the ethanol/gasoline blend markets. Result: This effort has been postponed. The Congressional earmarks, nearly \$40 million for the Biomass Program in FY 2002, resulted in a major reduction in EE's discretionary resources aimed at biomass R&D. In addition, EE's management, in consultation with Congress, directed that the funding originally intended for the development of a yeast technology platform be included in the Biomass R&D broad-based solicitation issued in FY 2002. (NOT MET) Plan of Action: If FY 2003 funding allows, EE will increase yeast R&D. Please note, however, that Congressional earmarks may require significant funding, resulting in fewer resources for our yeast platform work.</p>	<p>project that will result in a Generation-2 prototype yeast in late 2005. Cargill Dow and partners will develop and demonstrate technology for the production of lactic acid and ethanol from corn stover. One of the tasks is to develop and optimize a yeast capable of fermenting multiple sugars. This is a budget target for FY 2005.</p>
123	ER2-1	<p>Target: Complete initial testing of Detroit superconducting transmission cable and document operational costs and reliability. Result: Cables have been ordered, received and installed. However, small leaks in the vacuum cooling tube have prevented testing to date. Two cables have been removed for testing at the lab and one remains in place. (NOT MET) Plan of Action: We are working on addressing the leaks in the vacuum cooling tubes and concurrently trying to determine</p>	<p>Status: All planned tests at the Detroit Edison and Pirelli superconducting power cable project in the Frisbie Substation in Detroit were completed on August 8, 2003. The one remaining superconducting cable was tested for conductor characteristics with both Direct Current and Alternating Current. The data are being analyzed at Los Alamos National Laboratory to determine the Alternating Current loss parameters.</p>

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		<p>whether the remaining installed cable can be tested and provide sufficient information for documenting operational costs and reliability. In the event that this test cannot be performed at the Detroit site, we have begun to work with other utilities to find appropriate sites/partners to do similar testing.</p>	<p>The manufacturing, factory testing, and installation of three cables went as planned. The two inoperable cables were removed and sent back to the factory for extensive diagnostics testing. Two conventional cables were installed to replace them and plans of the project were completed with limited testing in July. While this was a major disappointment, much useful experience was gained. New “readiness reviews” were begun in the program with experts meeting regularly with project teams to review progress toward demonstration readiness to ensure that all important aspects of the system are sufficiently proven before installation. A project was approved in Albany, NY to install and test a 13.8 kilovolt, 600 megawatt cable of Long Island that pushes the envelope further than either the Detroit project or the Albany project.</p>
125	ER3-1	<p>Target: Publish one proposal for an upgrade to the Federal Residential Building codes, and one proposal for an upgrade to the Federal Commercial Building codes. Result: All supporting documents for commercial codes including the draft Notice of Proposed Rule are in the General Counsel’s office of DOE for concurrence. Preliminary concurrence</p>	<p>Status: Publication of the Federal Residential Notice of Proposed rulemaking (SNOPR) has been delayed by the need for revisions to make the proposed Federal Residential Code consistent with a major revision of the International Energy Conservation Code that was proposed by the Department in September 2003. This proposal</p>

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129	ER4-1	<p>from various agencies and FEMP has been obtained. Federal code staff work has been completed; significant comment response and redesign and timing of review currently underway by general counsel may result in delay for publication by one quarter. (NOT MET) Plan of Action: The delay is due to the need to complete the Environmental Analysis and assessment of impacts. The plan of action is to obtain and incorporate comments and revisions, if any, complete revisions to Environmental Assessment, and submit the mandatory concurrence package. Approval could be delayed until the second quarter of FY 2003.</p>	<p>which will make the code simpler to use and thus improve the level of compliance has received broad support and is expected to be approved by the International Code Council. (The Statute directs the Department to develop Federal building codes that are consistent with voluntary codes to the maximum extent possible.) Some revisions to the supporting economic analysis will also be required to update the analysis to reflect changes in the latest Energy Information Agency energy forecasts. The SNOPR will be published in March 2004 and the Final Rule in March 2004 and the Final Rule in March 2005.</p>
		<p>Target: Complete the injection of 2,500 tons of CO₂ into a depleting oil reservoir to monitor the transport of CO₂ and verify predictive geologic models on reservoir integrity. Result: This target was not met. The Bureau of Land Management did not issue the field operations permit that would lead to a favorable Record of Decision until the last week of September 2002. Also, the cost of the planned seismic survey has tripled since submission of the original proposal. This significantly higher</p>	<p>Status : This Target was met in the first and second quarters of FY 2003. The CO₂ was injected in the subsurface (depleted oil reservoir) at the field site in New Mexico, and follow-up post-injection assessments are presently being conducted. These assessments will be used, among other things, to verify predictive geologic models on reservoir integrity (as stated in the milestone).</p>

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		<p>cost resulted in a delay related to project funding adjustments. Instead of passing through Sandia National Laboratories, funds for the seismic survey are being transferred directly to the industrial partner, Strata Petroleum, Inc., resulting in a cost-savings of \$300,000. This savings has helped to offset increased costs of the field operations.</p> <p>(NOT MET) Plan of Action: NETL will exert more control over planned project activities and budgeted activities being managed by other National Laboratories. NETL will have more visits to the project site and continuously during the various phases of the project and emphasize to the lead lab, the industry partners, and selected field operation contractors that the project needs to stay on the prescribed schedule. More frequent project team meetings will occur in order to evaluate what issues and progress is being made toward the required field activities. It is currently anticipated that, according to the project's revised schedule and plans for conducting field activities, the following tasks will be completed by the end of FY 2003: (1) pre-injection 3D surface seismic geophysical survey, (2) down-hole Vertical Seismic Profile geophysical survey, (3) injection of 2500 tons of CO2 and micro-seismic monitoring, and (4) follow-up post-injection 3D surface seismic geophysical</p>	

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140	ER7-5	<p>survey (after a several-week soaking period for CO₂).</p> <p>Target: Complete two, and based on the technical merits of the grants, approve the continuation of 12 research and curriculum development awards funded by three-year Advanced Nuclear Medicine Initiative grants to universities, hospitals and research institutions. Result: Two three-year Advanced Nuclear Medicine Initiative grant projects have been completed. Technical merits of the 12 continuation research and curriculum development grants were evaluated using a peer-review process. Two continuation grants were awarded and ten continuation grants were not awarded before the end of the year. (MIXED RESULTS) Plan of Action: The remaining ten funding continuations are being processed and will be awarded by the end of the first quarter of FY 2003.</p>	<p>Status: All remaining grants have been awarded. Activity is complete.</p>
141	ER7-7	<p>Target: Complete a report to Congress comparing chemical processing, and pyroprocessing, accelerator-driven, and fast reactor alternatives for</p>	<p>Status: The Advanced Fuel Cycle Initiative Report was submitted to Congress on January 23, 2003. Activity is complete.</p>

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145	ER7-8	<p>transmutation, proliferation resistance, and life cycle cost estimates. Result: The "Report to Congress on Advanced Fuel Cycle Initiative: The Forward Path for Advanced Spent Fuel Treatment and Transmutation Research" was completed and is awaiting Office of Management and Budget concurrence. (MIXED RESULTS) Plan of Action: The Office of Management and Budget is expected to send the report to Congress.</p>	<p>Status : Meetings are currently underway between NNSA and the DNFSB to reach consensus. Activity is completed, pending consensus.</p>

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149	ER9-1	<p>2003. (MIXED RESULTS) Plan of Action: NNSA has established a response to each of the DNFSB concerns. The responses involve changes to the equipment or safety basis. Once consensus is reached with the DNFSB on the responses, the Department will move forward to complete the required actions to allow the scrap recovery line to be brought to full operation by the end of the second quarter of FY 2003.</p>	<p>Status: Job hazard analysis, a checklist of safety hazards for a particular task, is conducted for every job started by field maintenance crews. The checklist has been expanded to include back injury hazards and repetitive motion injuries. Ergonomic Training is to be conducted every 6 months. The first training was completed in June 2003. Safety meetings are conducted on-site once a month. Field personnel conduct these meetings, sharing hazard experiences in which they have been involved. This training has provided more meaningful on-the-job safety information and has resulted in greater safety awareness. The Safety Officer and two members of Southwestern’s senior management conducted safety presentations at each site in March 2003. In May 2003, grounding</p>
		<p>Target: Southwestern Power Administration will achieve a safety performance of a 3.3 recordable accident frequency rate for recordable injuries per 200,000 hours worked or the Bureau of Labor Statistics’ industry rate, whichever is lower. Result: At the end of FY 2002, Southwestern has a recordable accident frequency rate of 5.5 or 67% above the 3.3 recordable accident frequency rate. (NOT MET) Plan of Action: Southwestern has had one recordable injury due to electrical contact over a fifty-nine year period. The majority of incidents involve back injuries due to falls and lifting heavy objects. Even though the incidents have not been life threatening, they have caused lost work days. Southwestern is concerned about the obvious preventable incidents and is</p>	

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		<p>implementing the following plan of action:</p> <ul style="list-style-type: none"> • Place more emphasis on job briefings and job hazard analysis; • Conduct ergonomic training to address proper lifting and other correct work postures; • Involve employees in safety meetings by making peer presentations on how to work more safely and think safety before and during performance of a given task. Sessions will focus on slips, trips and falls, ergonomics, and attitude toward working safely; • Conduct formal safety presentations directed toward improving safety performance; • Assign collateral safety responsibility to the foreman and team leaders who will also attend Safety and Health Team meetings by teleconference every other month; • Perform a comprehensive review of standard operating work procedures to properly address slips, trips and falls, job hazard analysis and ergonomics; • Review the safety awards program for effectiveness; 	<p>training was provided to all sites. Notification of safety meetings is provided to the union. Union stewards attend. All other safety improvement items were completed successfully on-time.</p>

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		<ul style="list-style-type: none"> • Review employee performance elements to include a safety element; and • Involve the local union International Brotherhood of Electrical Workers in the safety program by presenting on-site safety meetings on safe working conditions and practices. <p>Target: Southeastern Power Administration will meet planned repayment of principal on power investment. Result: Net revenues for FY 2002 are below 80% of planned repayment of principal of the Federal investment. This is the result of several years of severe drought in the southeastern United States. Power purchase and wheeling expenses are high and revenue is considerably lower. (NOT MET) Plan of Action: Southeastern has proposed rate increases to increase revenue, changed rate design to pass through Power purchase and wheeling charges, and increased cost recovery from fixed charges. Rate studies are being evaluated to address one of the worst drought periods on record.</p>	<p>Status: A rate increase was implemented and was effective October 1, 2002. Action Plan complete.</p>

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		<p>Target: Western Area Power Administration will meet planned repayment of principal on power investment. Result: Incomplete results (data not available). Final results will be based on audited financial statements, estimated to be available in December 2002. Because of severe drought conditions across a large portion of Western’s service territory, resulting in reduced hydrogeneration, it is doubtful this target will be met. (NOT MET) Plan of Action: Rate adjustments for several of Western’s power systems will become effective in Fall 2002. Rate studies are continuing to be evaluated for the remaining systems. This performance target focuses on short-term repayment, with volatile results due to the strong influence of drought and the price of firming energy purchased to meet contractual commitments. Western is planning to adopt measures in its FY 2003 annual performance plan that are less short-term in nature, which reflect its record of repayment over time and are more compatible with the long-term focus of Western’s rate making methodology.</p>	<p>Status: During FY 2002, power generation and transmission activities provided for total payment of unpaid investment of \$24.0 million. Additional net repayment of \$33.2 million was made as a result of replacing estimates of revenues and expenses used in previous power repayment studies with actual amounts. As a result, total payment activity in FY 2002 equaled \$57.2 million. This adjusted amount exceeded the planned principal repayment of \$30.9 million by \$26.3 million. Action Plan complete.</p>
155	EQ1-2	<p>Target: Produce 205 canisters of HLW. Result: At the end of FY 2002, 173 canisters of HLW were</p>	<p>Status: EM met its FY2002 target shortfall for this</p>

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		<p>produced. (NOT MET) Plan of Action: Only 84% of the FY 2002 target was met due to the Defense Waste Processing Facility (DWPF) at the Savannah River Site not meeting its target. The processing facility did not achieve the expected canister production in FY 2002 because of melter degradation. This degradation was due to one of the four dome heaters failing and continued melter pour spout problems. The melter far-exceeded its design life of two and one half years by operating for over eight years. Though there are no specific plans to make up the FY 2002 shortfall in FY 2003, it is envisioned that the SRS Performance Management Plan will address any near-term canister production shortfalls.</p>	<p>measure.</p>
155	EQ1-2	<p>Target: Dispose of approximately 8,446 cubic meters of MLLW. Result: At the end of FY 2002, 8,435 cubic meters of MLLW were disposed of. (MIXED RESULTS) Plan of Action: Given the fact that 99.9% of the target was met, no plan of action was deemed necessary. It is expected that the FY 2003 target will be met.</p>	<p>Status: EM met its FY 2002 target shortfalls for this measure.</p>

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155	EQ1-2	<p>Target: Treat approximately 2,765 cubic meters of MLLW. Result: At the end of FY 2002, 2,694 cubic meters of MLLW were treated. (MIXED RESULTS) Plan of Action: Given the fact that 97% of the target was met, no plan of action was deemed necessary. It is expected that the FY 2003 target will be met.</p>	<p>Status: EM met its target shortfall for this measure.</p>
156	EQ1-3	<p>Target: Move to dry storage 601 metric tons heavy metal (MTHM) of spent nuclear fuel (SNF). Result: At the end of FY 2002, 510 metric tons heavy metal of SNF was moved to dry storage. (MIXED RESULTS) Plan of Action: Continued equipment and operational problems have significantly reduced the rate of N-Reactor spent nuclear fuel removal from wet storage in the Hanford K-Basin and packaging into Multi-Canister Overpacks for dry storage in the Canister Storage Building. The fuel primary cleaning machine basket failed, shutting down all fuel processing until another basket could be prepared and installed. In addition, a Multi-Canister Overpack failed an integrated leak test. The following corrective actions have been implemented to help increase equipment reliability and efficiency of moving fuel from wet to dry</p>	<p>Status: EM met its target shortfall for this measure.</p>

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158	EQ2-3	<p>storage: rinse and wash reductions, reduced fuel inspections, equipment improvements and redesign, additional spare parts, pre-planned work packages, and better maintenance outage planning and coordination. Despite these corrective actions, the FY 2002 target of 601 MTHM was not met.</p> <p>Target: Issue Nuclear Waste Policy Act Section 180(c) Notice of Revised Policy and Procedures was drafted and was undergoing Departmental review. However, as a result of this Departmental review, it was decided, in consultation with the Office of General Counsel, that it was not appropriate to issue the notice at this time. There are multiple reasons for this decision:</p> <ol style="list-style-type: none"> 1. The amount of related training States and Native American tribes have already received and continue to receive in response to the September 11, 2001, terrorist attacks. 2. The Nuclear Regulatory Commission and the Department of Transportation are considering revising their regulations to require armed escorts for all spent nuclear fuel shipments. 3. OCRWM will issue a transportation plan for 	<p>Status : In FY 2002, the Office of Civilian Radioactive Waste Management established the following performance measure: <i>Issue Nuclear Waste Policy Act Section 180(c) Notice of Revised Policy and Procedures for public comment.</i> The uncertainty following the attacks of September 11, 2001 and the prospect of revised regulations prompted the Program to delay the issuance of the revised policy and procedures. Instead, the Program committed that the Transportation Plan, scheduled for issuance in FY 2003, would address the manner in which the Program would proceed with the implementation of NWPA Section 180(c). The Program indicated that the development of the Transportation Plan would include opportunities for public comment.</p> <p>The Office of Civilian Radioactive Waste developed a draft of the Transportation Plan. A</p>

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167		<p>shipments to Yucca Mountain in FY 2003, which will discuss how Section 180(c) of the Nuclear Waste Policy Act will be implemented. (NOT MET) Plan of Action: RW's transportation plan, scheduled for issuance in FY 2003, will address how RW plans to proceed with the implementation of Section 180(c) of the Nuclear Waste Policy Act, and will include opportunities for public comment. This plan will also incorporate any changes resulting from possible revisions of NRC and DOT regulations.</p>	<p>permanent Director of the National Transportation Program assumed his position at the end of the fiscal year. He has performed a thorough review of the program and established the policies and milestones required to ensure its success. Resultant changes to the draft Transportation Plan are being incorporated and it is scheduled for issuance early in Fiscal Year 2004.</p>
	CMI-3	<p>Target: By September 30, 2002, define requirements for integrating financial information with budget and program information. Result: The Department has developed a comprehensive Plan of Action to integrate accounting, budget, and performance information and provide real-time management information to program and project managers. (MIXED RESULTS) Plan of Action: This plan, when executed over the next few years, will produce a new Business Management Enterprise Architecture that fully complements and supports the new Corporate Enterprise Architecture being developed by the Department's Chief</p>	<p>Status: In FY 2003, the I-Manage program defined a set of IT requirements to integrate budget and performance. In addition, as part of the President's Management Agenda, ME-20 developed a plan to integrate budget and performance and received approval of the plan from OMB. Although the plan will take several years to fully implement, requirements have been identified. Therefore, OMBE recommends closing this item.</p>

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170	CM1-6	<p>Information Officer (CIO).</p> <p>Target: Develop a DOE-wide “managing diversity” strategy to ensure consistency in approach, and educate top leadership on the interdependence of key change initiatives by showing links between managing diversity and related initiatives such as the Task Force Against Racial Profiling. Result: Led a comprehensive review of the Department’s diversity programs and developed a diversity improvement action plan which includes the following three major recommendations for managing diversity at DOE:</p> <ol style="list-style-type: none"> 1. Employ a systems approach toward workforce diversity; 2. Require accountability by supervisors and managers of each DOE element for the diversity of its workforce; and 3. Build diversity into the Department’s Human Capital Management Improvement Initiatives. <p>(MIXED RESULTS) Plan of Action: On racial profiling, DOE produced bi-monthly status updates on the Racial Profiling Task Force recommendations to the Deputy Secretary, noting</p>	<p>Status: ED completed all actions necessary to fully implement Target CM1-6. Recommendations for implementing action items are pending approval in the Office of General Counsel.</p>

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170	CM1-6	<p>completed recommendations. As part of these two initiatives, DOE issued a new diversity policy, a new sexual harassment policy, a policy on implementation of the President's Strategic Human Capital Management Program with respect to Hispanics, and initiated Quarterly Special Emphasis Programs.</p> <p>Target: Fully implement the Department's Minority Educational Institutions Strategy, and increase management accountability in implementing the DOE Strategic Plan. Result: Met with nine heads of Departmental elements to identify areas of support for minority educational institutions to enforce the Secretary's commitment for baseline funding levels and funding increases that equal levels achieved in fiscal year 1999. Develop a Policy Statement directing all Program Secretarial Officers to:</p> <ol style="list-style-type: none"> 1. Ensure that Minority Educational Institutions continue to be afforded the opportunity to compete in solicitations leading to financial assistance awards and/or contracts; 2. Establish funding goals consistent with the 	<p>Status : ED completed several initiatives necessary to full implement this Target. ED will continue to work Departmental Elements to establish additional partnerships with minority educational institutions. The Policy Statement is pending in the Office of General Counsel.</p>

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		<p>President's directive to increase funding to Historically Black Colleges and Universities and Hispanic serving institutions by 30% over the next five years; and</p> <p>3. Ensure that qualified science and engineering students and faculty of these institutions are adequately represented in research and engineering internships, fellowships, employment (including IPAs), and other opportunities. (MIXED RESULTS) Plan of Action: Commitments were received from five departmental elements to establish partnerships with Hispanic-serving institutions, Historically Black Colleges and Universities, and tribal colleges and universities. As of September 30, 2002, a Policy Statement Supporting Minority Education Institutions in the Departmental Core Mission Programs has been prepared and submitted to the Office of the General Counsel for concurrence.</p>	
172	CM2-1	<p>Target: Assess requirements for the Geospatial One-Stop project and develop a project plan by September 30, 2002. Result: The Office of the Chief Information Officer has assessed the requirements for the Geospatial One-Stop project in coordination with the Department's Geographic</p>	<p>Status : A GIS business case was submitted in the FY 2005 Capital Planning and Investment Control process, which occurred in September 2003.</p>

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		<p>Information Systems (GIS) community. A comprehensive inventory of the Department's GIS, which is a major project requirement, has been developed to collect GIS data for the Department, and will be released in November 2002. The results will be reported to the Federal Geographic Data Committee (FGDC). (MIXED RESULTS)</p> <p>Plan of Action: The Geospatial One-Stop project prospectus has been developed, and the project plan is currently being drafted and will be completed by December 30, 2002. The Departmental representative is currently working with the Geospatial One-Stop project representatives to develop an overall plan for this E-Government initiative.</p>	
172	CM2-1	<p>Target: Increase usage of citizen-centric Energy.gov website by five percent. Result: The Energy.gov website is being reviewed for potential improvements as part of the Department's E-Government initiative process called Innovative DOE E-Government Applications (IDEA). After improvements are made, usage is expected to increase by five percent. (MIXED RESULTS)</p>	<p>Status: The Office of the Chief Information Officer accomplished the migration of content from four program offices to Energy.gov by September 2003. Action complete.</p>

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		<p>Plan of Action: Implementation of the findings and recommendations will begin early FY 2003.</p>	
172	<p>CM2-1</p>	<p>Target: Issue draft Departmental policy and guidance on the use of websites, which includes Section 508 compliance, by September 30, 2002. Result: Submission of the draft Notice to the directives system has been withheld pending impact assessment on the Innovative DOE E-Government Applications (IDEA) efforts. (MIXED RESULTS) Plan of Action: The impact assessment will establish the value and impact of the draft Notice based on supporting and limiting requirements of the Notice. Staff within the office of the Chief Information Officer will conduct the assessment against established IDEA activities. Upon completion of the assessment and final internal review, the Notice will be formally submitted to the departmental Directives System for coordination, issuance, and implementation.</p>	<p>Status: Due to changing priorities, the Section 508 impact assessment on the IDEA initiatives was not completed; therefore, the draft website usage notice to include Section 508 has not been submitted to the Departmental Directives System and is still pending. The Office of the CIO will complete a high-level impact assessment before the end of December 2003 and publish Section 508 compliance guidance on the CIO website in order to expedite its distribution to the DOE community by September 2004.</p>
174	<p>CM3-2</p>	<p>Target: Develop and implement a comprehensive cyber security program that implements risk-based policies and guidance for the protection of cyber assets. Specifically:</p>	<p>Status : (3) The updated threat statement has been prepared and is in management review. The expected publication date is September 30, 2003. (6) The CIO, in coordination with the Office of</p>

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		<ul style="list-style-type: none"> • Update and implement a DOE Cyber Security Program Action Plan; • Launch a cyber security performance measurement program; • Issue an updated Cyber Security Threat Statement; • Develop and update a Cyber Security Performance Improvement Plan and Cyber Scorecard; • Integrate the cyber security capital planning process with the IT capital planning process; • Complete Project Matrix Step One to identify the Department's national critical infrastructure, and launch Project Matrix Step Two to identify the interdependencies in the infrastructure. Result: (1) This target has been met. The OCIO developed and updated the Cyber Security Performance Improvement Plan and the Cyber Security Scoreboard. (2) This target has been met. The action plan was updated and implemented in April 2002. (3) Update of the Cyber Security Threat Statement is in progress. See the plan of action for more 	<p>Security, will continue its ongoing process to develop, coordinate, and publish DOE-wide policies and directives supporting DOE's Integrated Safeguards and Security Management framework. These directives require the identification and protection of all operations and assets, including critical cyber and physical assets and their interdependencies. Further guidance from the Department of Homeland Security will be used, as available, to refine DOE plans.</p>

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		<p>detail.</p> <p>(4) The cyber security capital planning process has been fully integrated into the Department's IT capital planning documents. The Department IT Management framework document was published.</p> <p>(5) Completion of Project Matrix Step One and launching of Project Matrix Step Two is in progress. See the plan of action for more details.</p> <p>(MIXED RESULTS) Plan of Action: (1) During the first quarter of FY 2003, several implementation manuals will be entering the department's Directives System process.</p> <p>(2) The cyber security performance measurement program is currently undergoing management review and approval. The program will be published in the first quarter of FY 2003.</p> <p>(3) An updated threat statement will be completed in the first quarter of FY 2003.</p> <p>(4) Due to the delay in collecting asset data, Step One will be completed in the first quarter of FY 2003. The Office of Security is developing a strategic plan that outlines the progress of the</p>	<p>The updated threat statement has been prepared and is being reviewed by the Cyber Security Coordination Group. The expected publication date is October 25, 2003.</p> <p>The Office of Cyber Security is awaiting final publication of Project Matrix Step One from Homeland Security. Once it is received an analysis will be conducted to determine specific follow-on</p>

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		Project Matrix program.	steps.
178	CM5-1A	<p>Target: Complete the milestones listed in the FMFIA corrective action plan for the Significant Issue of Security. Result: A ten-year DOE-wide Security Strategic Plan was drafted which promulgates safeguards and security policy based on a sound understanding of threats and capabilities to respond. The DOE Design Basis Threat Interim Guidance, which identifies vulnerabilities and addresses evolving threats against DOE was issued in January 2002. These management tools provide a body of technical information to implement effective security programs for protecting the Nation's security and valuable assets. The FY 2002 Annual Policy Assessment Report, published in October 2002, promulgates safeguards and security technological solutions to meet priority needs. (MIXED RESULTS) Plan of Action: Publish DOE-wide Security Strategic Plan (ten years) in the second quarter of FY 2003.</p>	<p>Status : The 10-year DOE Strategic Security Plan was published March 24, 2003 (2nd Quarter FY2003).</p>

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178	CM5-1A	<p>Target: Publish DOE-wide Strategic Plan for Security. Result: A ten-year DOE-wide Strategic Security Plan was drafted. The plan details how to counter the evolving threat with improved protection capabilities. Much of the focus over the coming years will be the use of technological solutions in defending against threats. Every effort will be made to consolidate special nuclear material into fewer secure facilities. We will continue to enhance our relationships with other U.S. Government agencies, and actively support Homeland Security initiatives to ensure the security of both the Department's critical infrastructure and the nation's critical energy infrastructure.</p> <p>(MIXED RESULTS) Plan of Action: Publish DOE-wide Security Strategic Plan (ten years) in the second quarter FY 2003.</p>	<p>Status: The 10-year DOE Strategic Security Plan was published March 24, 2003 (2nd Quarter FY2003).</p>
180	CM5-1B	<p>Target: Formerly NS6-2: Providing Security and Emergency Operations. Functions were transferred to NNSA, the Office of Security, the Office of Energy Assurance, and the CIO. Result: There</p>	<p>Status: SO has incorporated all required changes into draft DOE O 142.X, including principal roles and responsibilities for hosts of foreign national visitors and assignees; clear identification of</p>

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		<p>were four Inspector General reports and one GAO report associated with the PSPG NS6-2 that contained recommendations for SO. SO has closed out all actions for which it had responsibility or transferred them to the appropriate organization for action, with one exception. Under IG Report IG-0482, policy issuance was delayed due to the moratorium placed on security policy changes during the Hamre Commission review. The moratorium has since been lifted, and SO is proceeding with the policy issuance process. The issuance of a DOE Order will close the five open recommendations contained in IG report – IG-0465. The Office of the Chief Information Officer (OCIO) has responsibility for two of the recommendations in the reports mentioned above, which are both on track. OCIO reports the following results:</p> <p>(1) Implement IG recommendations directed at the Department’s Unclassified Cyber Security Program through the Cyber Security Performance Improvement Plan and the release of a series of policy directives. This target is on track for the completion date of September 2003.</p> <p>(2) Improve metrics for successful implementation of Department-wide cyber security measures and</p>	<p>foreign national visits and assignments and responsible officials and organizations; and the requirement for documentation in the Foreign Access Central Tracking System (FACTS) for all visit and assignment requests that require documentation. In addition, sites formerly exempt are currently required to enter all visit and assignment information into FACTS. The draft Order is going through the Department’s directives review/comment/approval process with an anticipated issuance date of March 2004. A “reiteration of policy” memorandum was issued by SO to Departmental Elements on October 28, 2003. (Addresses open recommendations in IG report IG-0465)</p> <p>Draft DOE Order 470.1A on the Department’s Safeguards and Security Program which addresses high initial cap and moderate initial cap risk conditions and associated actions is going through the Department’s directives review/comment/approval process with an anticipated issuance date of January 2004. In the interim, a policy clarification memorandum was issued on September 29, 2003. (Addresses open</p>

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		<p>incorporate significant cyber security metrics in Departmental performance plans. (MIXED RESULTS) Plan of Action: (1) The Performance Improvement Plan is in place, and a database to track the completion of the recommendations by the CIO and PSOs is updated on a near real time basis. The Cyber Security Policy document has been promulgated. The supporting manuals are in final review with the CIO Policy Working Group.</p> <p>(2) The Departmental Cyber Security metrics package and its implementing memo will be used to support the performance measure requirements being written into the new cyber security policy directives mentioned above. These metrics will also be rolled up from the Program by the OCIO to provide senior management with trends and analysis regarding the status of the Department's Cyber Security Program. The resulting analysis will also be used in establishing initial cyber security measures for DOE and updating the status of the Department's cyber security in relation to those measures for the Departmental performance plans.</p>	<p>recommendations in IG report IG-0482)</p>
181	CM5-2A	Target: Develop 20 tactical analysis summaries	Status : Site Counterintelligence Offices have

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		<p>and four strategic analysis assessments, annually update site-specific threat assessments, and produce the annual DOE threat assessment. These assessments identify targeting of Departmental personnel and assets. Result: In FY 2002, the Analysis Program completed more than 20 tactical analytical products, to include Counterintelligence Notes and disseminations of U.S. Intelligence Community terrorism information. The Program also completed several strategic analytical assessments, to include country threat assessments, foreign intelligence threat summaries, and other strategic products, exceeding its goal of four. The Program produced the annual DOE threat assessment. Finally, the Program conducted site-specific threat assessments at all major sites; however, not all smaller sites were assessed. (MIXED RESULTS) Plan of Action: Site-specific threat assessments at smaller sites will be conducted as rapidly as possible in the upcoming fiscal years, consistent with manning limitations. Additionally, CN will work with ME to make adjustments to this metric. Due to lack of analytical assets, annual updates of all threat assessments are an unrealistic expectation. Fortunately, experience indicates that basic threat assessments are very important, but updates are not</p>	<p>completed threat assessments for a majority of the sites within their purview. Threat assessments are underway and will be complete in FY 2004 for the rest of the sites for which a threat assessment is required. All threat assessments will be updated as warranted to reflect the changing threat.</p>

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183	CM5-3	<p>necessarily needed annually.</p> <p>Target: Reorganize the Office of Intelligence to reflect post-September 11 intelligence priorities and threats to the DOE complex. Result: Due to the departure of the Director of the Office of Intelligence, plans to reorganize the organization have been placed on hold. (NOT MET) Plan of Action: Once the new Director has been chosen, the reorganization plans will be re-evaluated.</p>	<p>Status : Earlier this year, Mr. John Russack was selected to be the Director of the Office of Intelligence. He recently presented preliminary plans for the reorganization of IN-1 around the Director, and two Deputy Directors (one for intelligence, and one for management, administration and operations). The complete details for the newly restructured office went into effect as of 1 October 2003. Additionally, all of the personnel related issues have been completed. Action complete.</p>