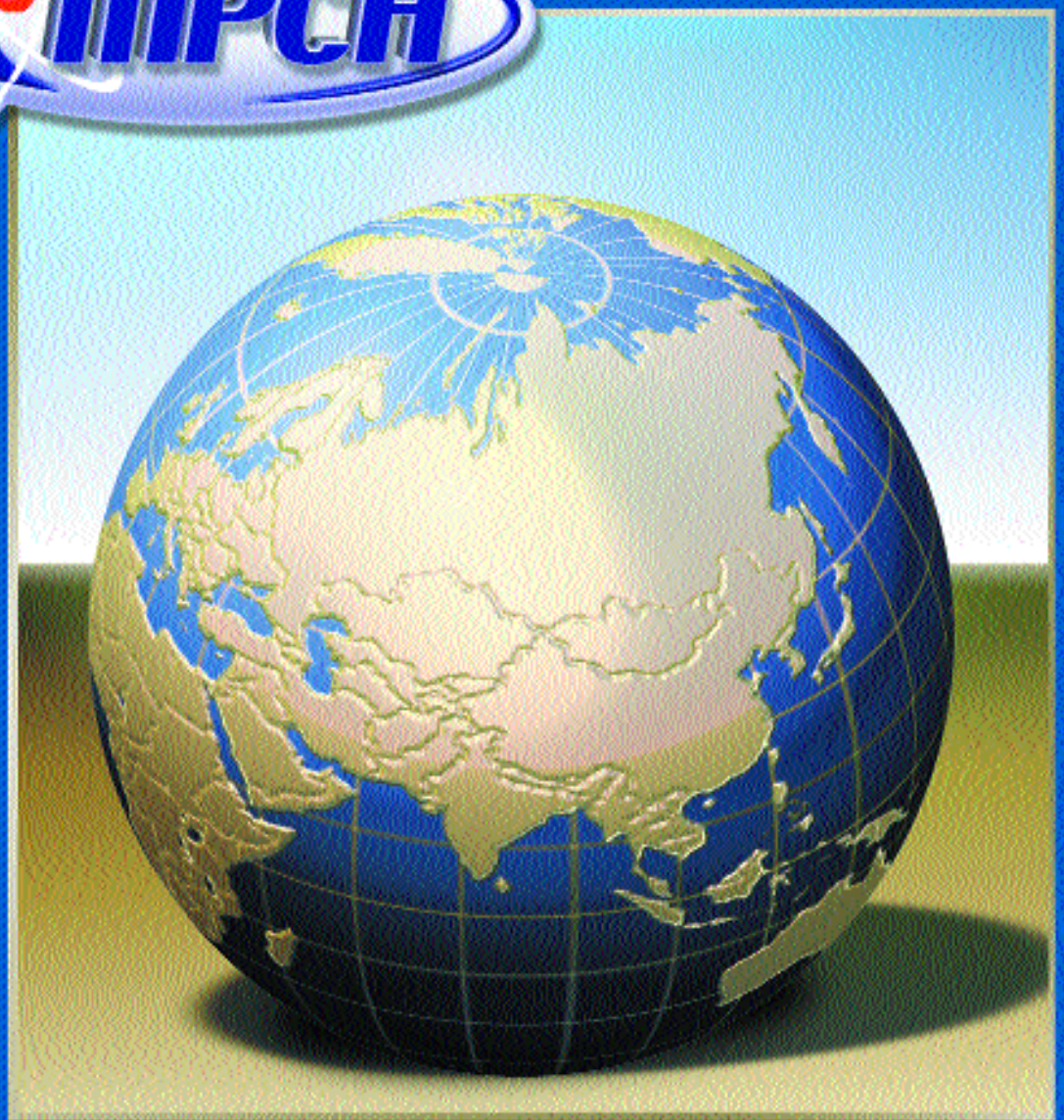

MPC&A Program

Strategic Plan

July 2001

Department of Energy

National Nuclear Security Administration

Message from the Assistant Deputy Administrator

"The most urgent unmet national security threat to the United States today is the danger that weapons of mass destruction or weapons-usable materials in Russia could be stolen and sold to terrorists or hostile nations and used against American troops abroad or citizens at home."

Secretary of Energy Advisory Board (SEAB) Report[1]

The need to protect, control, and account for nuclear weapons and weapons-usable nuclear material in the former Soviet Union (FSU) from theft or diversion is vital to U.S. national security.

For example, Russia and the New Independent States (NIS) alone possess, according to current estimates, 603 metric tons of weapons-usable nuclear material — enough to produce more than 41,000 nuclear devices. At the same time, the political and economic upheavals of the past decade have substantially weakened Russia's control and security infrastructure over these materials. In addition, other countries, such as Iran and North Korea, have developed ballistic missile capabilities and may well seek to acquire nuclear weapons for those missiles. Terrorist activities are increasing, as shown by the October 2000 bombing of the USS Cole. Weapons of mass destruction in the hands of terrorists or rogue nations could be used against us, or our allies.

The Material Protection, Control and Accounting (MPC&A) Program is the nation's first line of defense against the threat of theft or diversion of unsecured Russian nuclear weapons or weapons-usable nuclear material. Driven by the dedication and hard work of the people implementing the Program, we have already achieved significant risk reduction. For example, by the end of fiscal year 2001, MPC&A project teams will have completed comprehensive protection, control, and accounting upgrades at thirty-eight sites in Russia and the NIS. However, the job is far from done, and the danger to U.S. national security remains unabated.

This updated MPC&A Strategic Plan presents a focused and comprehensive strategy for continued Program success and progress toward reducing the risk to U.S. national security. The Plan sets forth the mission and vision of the Program, and establishes goals, objectives, and performance measures. Combined with the talented personnel involved in the Program, this Plan provides a solid foundation for taking the next steps toward completing our mission.

Jack Caravelli
Assistant Deputy Administrator

1 "A Report Card on the Department of Energy's Nonproliferation Programs with Russia," The Secretary of Energy Advisory Board, January 10, 2001.

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"American security is threatened less by Russia's strength than by its weakness and incoherence. This suggests immediate attention to the safety and security of Moscow's nuclear forces and stockpile."

National Security Advisor, Condoleezza Rice

ENHANCING U.S. NATIONAL SECURITY

The U.S. Department of Energy (DOE), National Nuclear Security Administration (NNSA), Office of Nonproliferation and National Security (NN), Office of International Material Protection and Emergency Cooperation (NN-50) is responsible for implementation of the Material Protection, Control and Accounting (MPC&A) Program. The MPC&A Program was established to address the bipartisan consensus that a concerted response is required to reduce the threat to U.S. national security posed by the vast quantities of poorly secured Russian fissile materials and warheads. The MPC&A program seeks to prevent the theft and diversion of Russian nuclear weapons and nuclear weapons-usable material by consolidating, securing, and reducing the stocks of weapons grade fissile material. The MPC&A program is the nation's first line of defense against nuclear smuggling and nuclear terrorism.

THREAT TO U.S. NATIONAL SECURITY

The breakup of the Soviet Union reduced one set of threats to U.S. national security but created another — the threat posed by the vast quantities of poorly secured Russian fissile materials and warheads. The nuclear material at Russian sites is vulnerable to theft because the security system that protected this material during the Soviet period has weakened considerably due to a sustained period of political and economic upheavals. The Soviet system was focused on preventing outsider threats. It relied heavily on the use of military guards and on constant surveillance of personnel by state security forces, such as the KGB. This "guards, guns, gates, and gulag" approach was very effective. Moreover, workers within nuclear facilities had little incentive to divert nuclear material because they enjoyed relatively high wages, high social status, and other benefits.

Eroding Soviet-era perimeter fences do not provide adequate defenses for facilities within a site.

Russia's ongoing economic crisis has destroyed the foundations of this system. Physical protection barriers have crumbled and the nuclear material accounting system is in disarray. Additionally, budget cuts have decreased the number and effectiveness of guard force personnel, security system maintenance activities, and supporting infrastructure. For example, guards and material custodians are not paid regularly. To reduce costs and retain key scientific staff, many nuclear facilities cut spending for nuclear material security systems. Many nuclear workers, who in the past were part of the Soviet elite, now live under difficult conditions because wages are often delayed and the quality of available food, housing, and medical care has declined. These circumstances increase the chance that "insider" personnel could be tempted to steal nuclear material for financial gain.

BLACK MARKET DEMAND

While weak security systems leave Russian nuclear materials vulnerable to theft, the demand for such materials continues to rise.

- Weapons of Mass Destruction (WMD) programs are under development in Iran, Iraq, and North Korea. Fissile material is a key requirement for these programs.
- Iran, among others, has tried to exploit Russia's nuclear security problems by attempting to acquire fissile materials.
- Iran and North Korea have developed ballistic missile capabilities.
- Osama bin Laden's Al Qaida organization has reportedly tried to acquire fissile material in Eastern Europe and Africa, indicating that the demand for black market fissile materials persists. bin Laden is responsible for terrorist attacks, such as the 1998 U.S. embassy bombings in Africa.

To reduce the nuclear proliferation risks associated with these new and evolving insider and outsider threats, facilities in the FSU, with U.S. assistance, are installing improved nuclear security systems that employ modern technology and strict material control and accounting principles.

Osama bin Laden, who has reportedly tried to acquire fissile material, is responsible for terrorist attacks, such as the 1998 U.S. Embassy bombings in Africa.

NUCLEAR SMUGGLING

The demand for fissile material is also demonstrated by cases of theft or attempted theft of nuclear weapons and weapons-usable nuclear material. Several examples are shown in Figure 1 below:

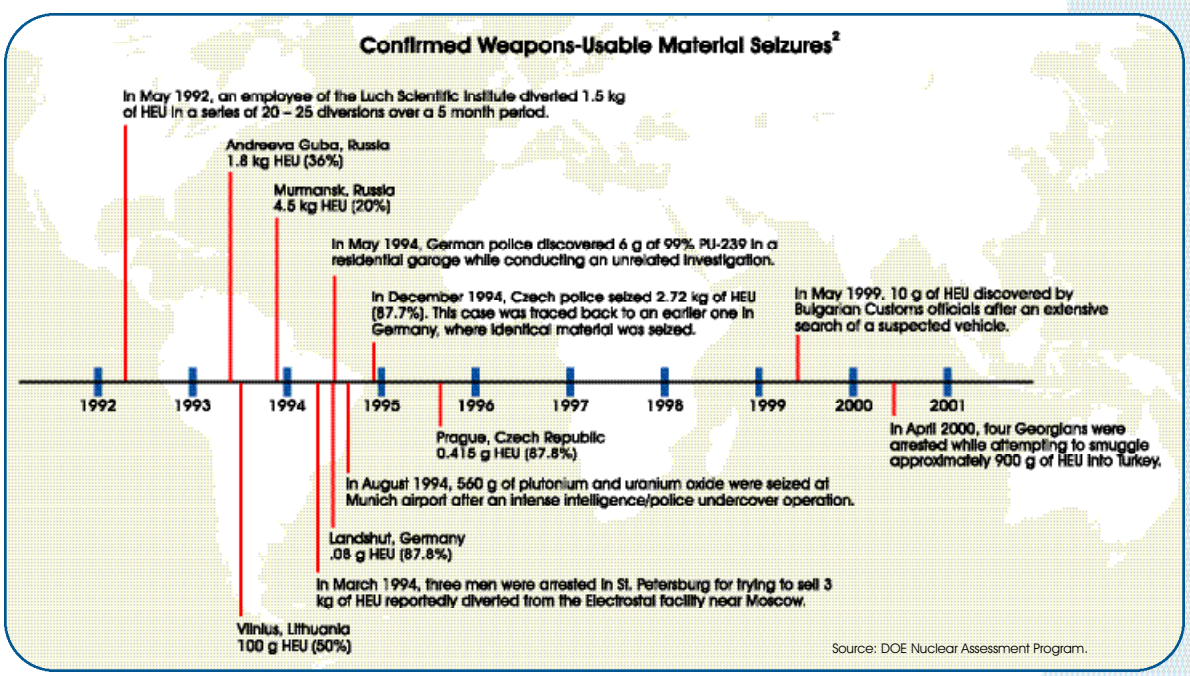
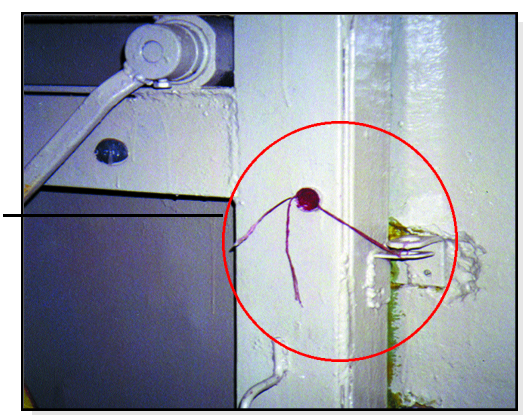


Figure 1. Nuclear Smuggling Time Line

2 Enrichments have not been independently verified for all seizures.

"A nuclear engineer graduate with a grapefruit-sized lump of HEU or an orange-sized lump of plutonium could fashion a nuclear device that would fit in a van like the one the terrorist Yosif parked in the World Trade Center in 1993."

Secretary of Energy Advisory Board (SEAB) Report[3]



Soviet-era wax and string seal did not adequately protect nuclear material storage vaults.

MAGNITUDE OF THE THREAT

The possibility that weapons-usable nuclear materials (highly enriched uranium [HEU] and plutonium [Pu]) could be stolen or diverted is a common threat in the international community.[4] These materials are the essential ingredients of nuclear weapons. Loss of even small amounts of this dangerous material could enable additional states or a terrorist organization to build a nuclear weapon.

The threat posed by this material is urgent. The MPC&A Program estimates that 603 Metric Tons (MTs) of weapons-usable nuclear material, located at 53 sites in the FSU, requires upgrades. This is enough material to make approximately 41,000 nuclear devices using the International Atomic Energy Agency's (IAEA) definition of a significant quantity.[5] In addition, the MPC&A Program is currently assisting in securing approximately 4,000 nuclear warheads located at 42 Russian Navy storage sites.

During the initial phase of the MPC&A Program our experts found systemic weaknesses in the FSU's nuclear material security systems, including:

- Lack of unified physical protection standards and inadequate defenses of buildings and facilities within the site.
- Lack of portal monitors to detect fissile materials or weapons leaving or entering a site.
- Inadequate central alarm stations, alarm assessment and display capabilities.
- Inadequate protection of guards from small-arms fire and inadequate guard force communications.
- Lack of material accounting procedures that can detect and localize nuclear material losses.
- Inadequate measurements of waste, scrap, and hold-up nuclear materials during processing and transfers of nuclear materials between facilities.
- Antiquated tamper-indicating devices (seals) on nuclear material containers that cannot guarantee timely detection of nuclear material diversion.

3 "A Report Card on the Department of Energy's Nonproliferation Programs with Russia," The Secretary of Energy Advisory Board, January 10, 2001.
4 In this report, weapons-usable nuclear material is HEU enriched above 20 percent U235, and Pu not in irradiated fuel.
5 The IAEA estimates 25 kgs of HEU or 8 kgs of Pu could be used to construct a nuclear device.

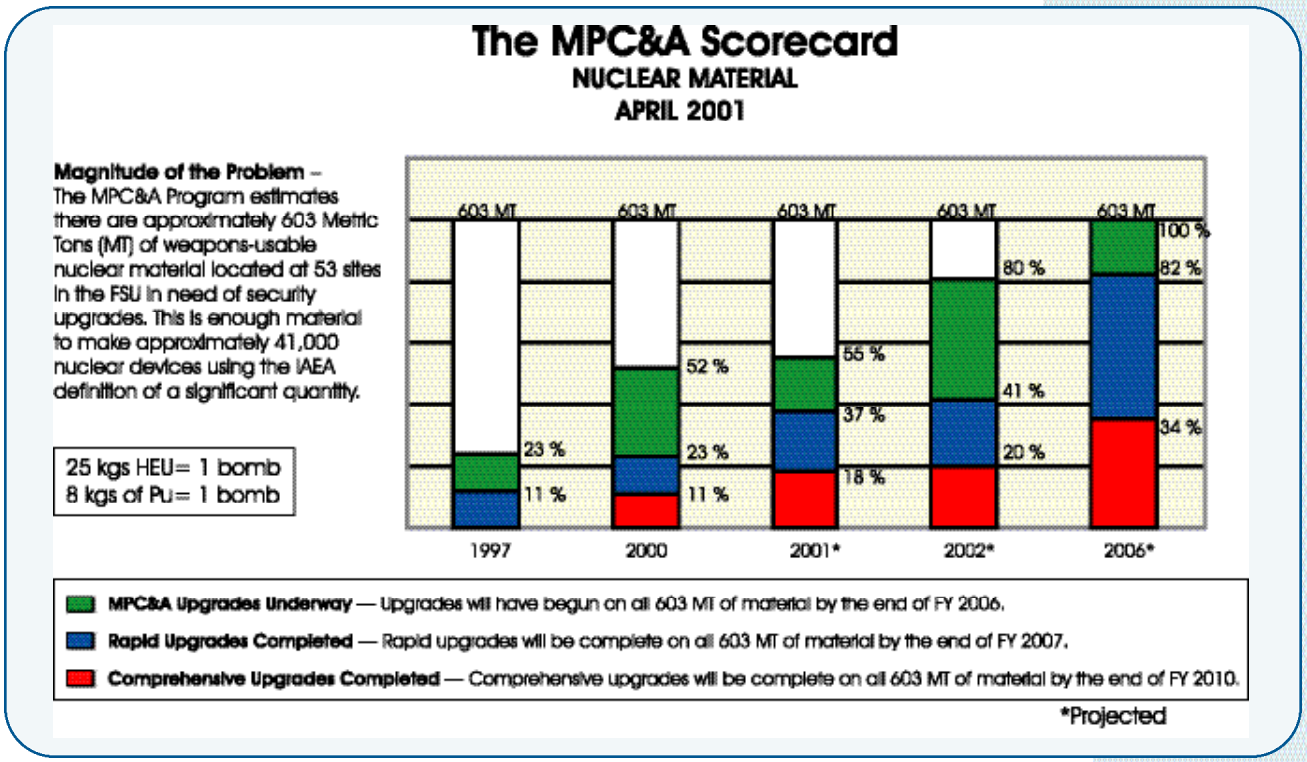


Figure 2. Program Accomplishments — Nuclear Material

ROLE OF MPC&A

Modern, well-designed nuclear MPC&A systems provide a cost-effective and reliable way of securing nuclear material from both insider and outsider threats. Improving MPC&A systems at sites where nuclear material has been protected inadequately is a central component of the U.S. response to a critical nonproliferation objective. Such improvements help to prevent nuclear material from entering the smuggling pipeline, where it is difficult if not impossible to recover. MPC&A improvements thus provide a first line of defense against nuclear smuggling, which could lead to nuclear proliferation or nuclear terrorism.

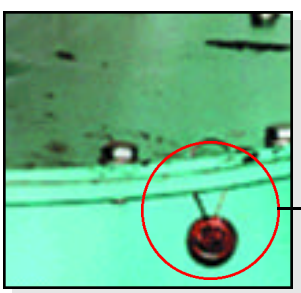
Major components of the MPC&A system include:

Physical protection systems are designed to detect and delay any unauthorized penetration of barriers and portals, and to respond with immediate investigation and use of force, if necessary. Physical protection measures are generally the most visible and pervasive components of a nuclear safeguards system. Guards, fences, multiple barriers to entry, limited access points, alarms, and motion detectors are examples of a physical protection system.

A guard scans a site employee with a hand-held special nuclear material detector.

An upgraded perimeter with improved fence, clear zone, and intrusion detectors provide increased security.

An access control system, including a nuclear materials portal monitor and turnstile prevents entry of unauthorized personnel.



Modern Tamper Indicating Device is used to detect theft of nuclear materials.

Items such as fuel pins are measured using non-destructive assay equipment.

Material control systems are designed to limit access and to promptly detect the theft or diversion of the material should it occur. These systems may include portal monitors and other devices to control egress from storage sites. Material control is also achieved through the use of secure containers for nuclear material, seals, and identification codes that make it possible to easily verify the location and condition of nuclear material, as well as material use and storage rules and procedures.

Material accounting systems are designed to confirm the presence of nuclear material in inventory, to measure the loss of any material not accounted for, and to provide information for follow-up investigation. Material accounting systems include both traditional inventory systems and an array of equipment to measure the types and quantities of nuclear material in a given area.

ESTABLISHMENT OF THE MPC&A PROGRAM

U.S.-Russia cooperation to improve MPC&A began in September 1993 following passage of the Soviet Nuclear Threat Reduction Act of 1991 ("Nunn-Lugar"). Early cooperation focused on MPC&A demonstration projects at Low Enriched Uranium (LEU) facilities as a way to initiate confidence building measures between the two countries. In 1994, DOE initiated a second approach to joint U.S.-Russian MPC&A cooperation, the "Laboratory-to-Laboratory" program. This effort encouraged U.S. national laboratories to cooperate directly with the Russian Federation's nuclear institutes to improve MPC&A. The "Lab-to-Lab" program complemented the original "Government-to-Government" approach.

In September 1995, President Clinton issued Presidential Decision Directive 41 (PDD-41) on "U.S. Policy on Improving Nuclear Material Security in Russia and Other Newly Independent States." This directive assigned DOE formal responsibility within the U.S. Government for directing the MPC&A Program. Following the President's directive, DOE created the Russia/NIS Nuclear Material Security Task Force. A formal agreement with Russia's nuclear regulator, Gosatomnadzor (GAN), initiated cooperation at a number of independent nuclear sites, and in the development of a regulatory framework. In 1996, the U.S. and Russia agreed to initiate MPC&A cooperation with the Russian Navy, further increasing the number of sites under the Program's purview.

In 1997, the "Government-to-Government" and "Lab-to-Lab" programs merged into a single program under federal oversight. DOE implemented improved computer-based financial and status monitoring for projects, and established a set of MPC&A upgrades guidelines in 1998 to ensure consistency among projects. DOE also formed a Technical Survey Team to

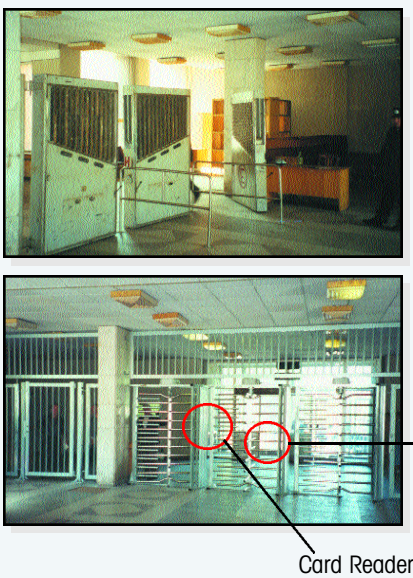
provide technical reviews of all projects in order to ensure consistency with the MPC&A upgrades guidelines. It became clear that in addition to a substantial increase in the number of locations that have nuclear materials, DOE would have to focus on not only installing MPC&A equipment, but also on ensuring operation and sustainability of the upgraded MPC&A systems over the long term.

The economic crisis in Russia in August 1998 led to a review of Program assumptions. DOE initiated an "emergency measures" program to provide winter clothes for the Russian site guard forces, heaters for vital guard force locations (e.g., Central Alarm Stations and guard posts) and short-term system operations contracts. The "emergency measures" effort laid the groundwork for an expanded Site Operations and Sustainability program focused on ensuring Russian sites operate and sustain MPC&A systems over the long term. In 1999, DOE initiated the Material Consolidation and Conversion (MCC) program to consolidate nuclear materials into fewer buildings and fewer sites and to convert those materials into a form not usable in nuclear weapons. That same year, work with the Russian Navy expanded from fresh fuel to nuclear weapons storage sites. Also in 1999, the Task Force evolved into a permanent organization, the Office of International Material Protection and Emergency Cooperation (NN-50).

MPC&A ELEMENTS

To comprehensively address the scope of the problem, the MPC&A program drew upon extensive U.S. experience in securing nuclear materials. The program has established three primary focus areas: Secure, Reduce and Sustain.

- ***Secure:*** Install physical security and accountancy upgrades appropriate for the level of material attractiveness and the threat of theft[6]
- ***Reduce:*** Consolidate material into fewer buildings at fewer sites and convert excess HEU to LEU, reducing the number of theft targets and costs
- ***Sustain:*** Encourage the development of Russian capabilities and commitments to operate and maintain these security improvements



An open entrance is upgraded with access control turnstiles and card readers

A nuclear material container with no lock is upgraded to a hardened delay requiring two-person authorization.

6 The Program's mission is national security oriented and does not address safety, sabotage, or the environment.

MPC&A ORGANIZATION STRUCTURE

The Office of International Material Protection and Emergency Cooperation (NN-50) is divided into five functional Program areas—four MPC&A areas: the MinAtom Weapons Complex Division, the Civilian and Consolidation Division, the Navy Complex Division, and the National Programs Division; and one non-MPC&A area, the International Emergency Cooperation Division.

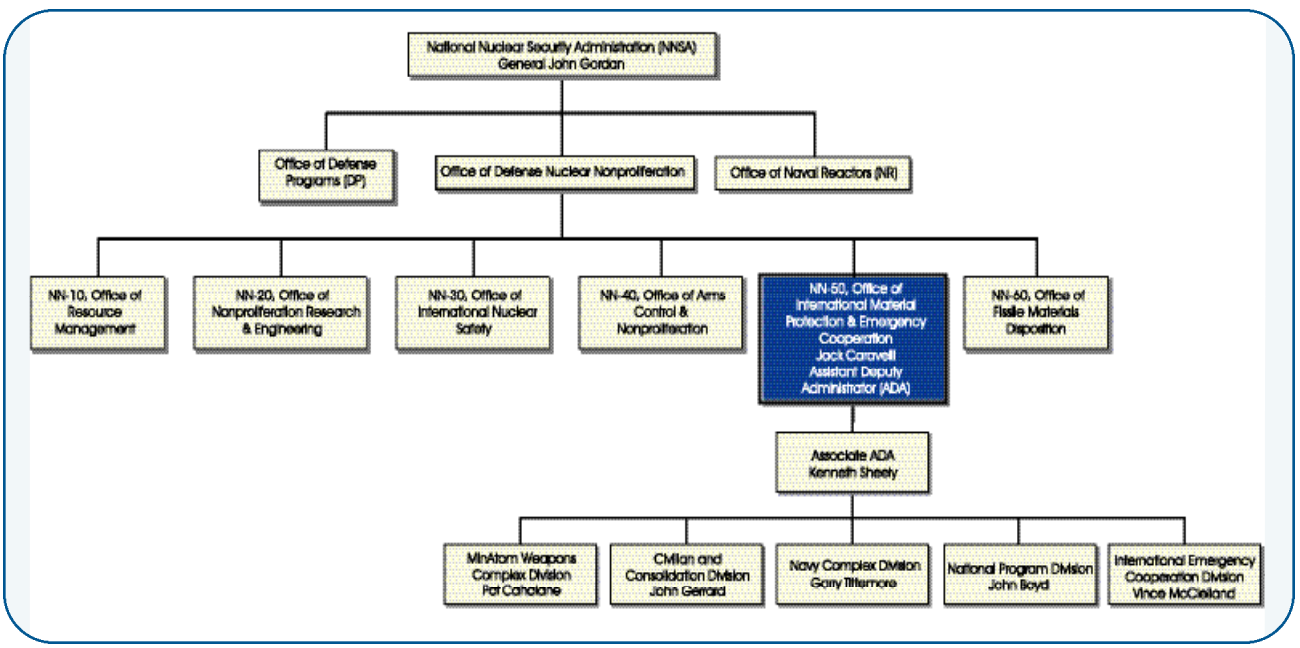


Figure 3. NN-50 within the NNSA Organization

- ***The MinAtom Weapons Complex Division*** manages cooperation with MinAtom to secure nuclear materials at MinAtom's weapons complex nuclear sites that store HEU and Pu. The MinAtom Weapons Complex, composed of Russian closed cities, consists of seven sites and four Enterprises of the Nuclear Weapons Complex, also known as Serial Production Enterprises, and accounts for more than 500 MT of the most highly attractive weapons-usable materials.
- ***The Civilian and Consolidation Division*** is responsible for three key nuclear nonproliferation initiatives. The first focuses on cooperative efforts with MinAtom to install comprehensive MPC&A upgrades at the seven large Russian civilian nuclear facilities that store

weapons-usable HEU and Pu. Next, the Division is working to ensure the long-term operation and maintenance of MPC&A systems already completed at nine Russian civilian research reactor sites. Finally, in 1999 the Division began the Material Consolidation and Conversion (MCC) project. The primary objective of this initiative is to simplify the task of protecting Russia's weapons-usable nuclear materials by reducing the number of proliferation targets through the consolidation of HEU and Pu into fewer buildings at fewer sites. An equally important element of this activity involves the conversion of the nuclear material into a form not usable in weapons, thus eliminating the proliferation concern.

- ***The Navy Complex Division*** manages cooperation on nuclear protection and security issues with the Russian Navy. DOE has been cooperating with the Russian Federation Navy to upgrade the security at naval nuclear weapons storage facilities and naval HEU fuel at storage sites and aboard nuclear powered service ships. Recent accomplishments are shown in Figure 4.

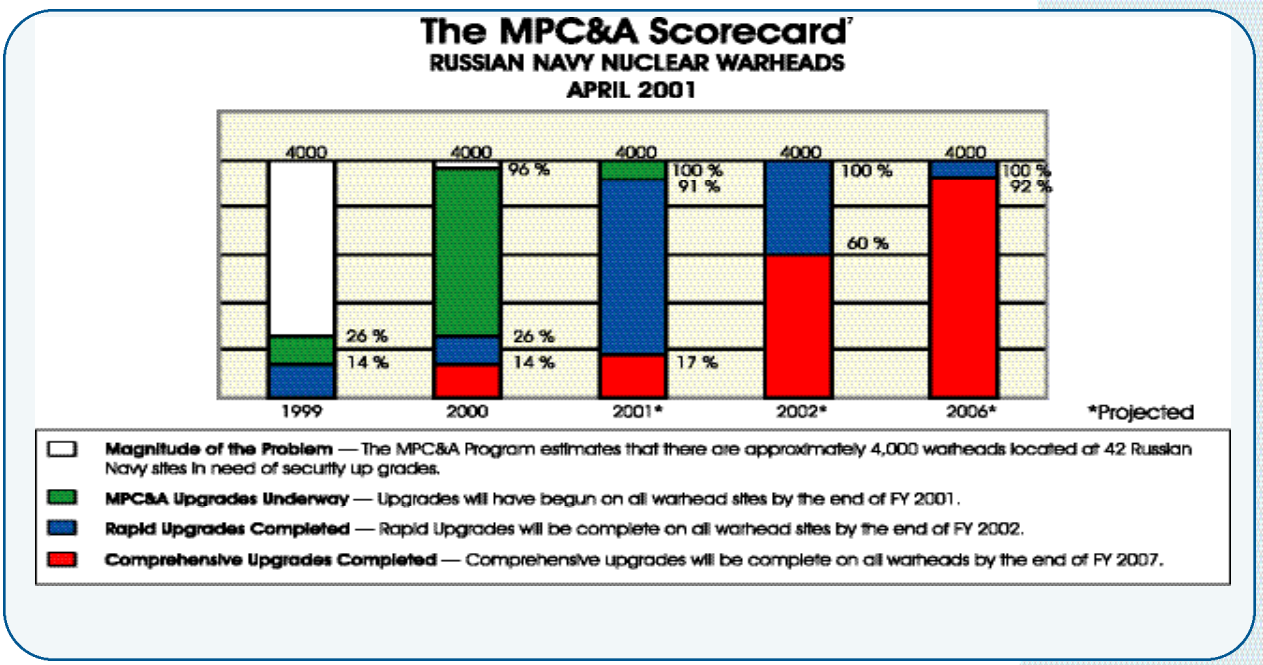


Figure 4. Program Accomplishments — Russian Navy Nuclear Warheads

7 Robert S. Norris and William M. Arkin, "NRDCNuclear Notebook: Russian Nuclear Forces, 2000," The Bulletin of Atomic Scientists Vol. 56, No. 4 (July/August 2000): 70, estimates Russian Navy nuclear warheads at about 4,000.

Nuclear materials are transported between sites in new secure trucks with overpacks to protect the fissile material.

- ***The National Program Division*** focuses on cross-cutting issues that help foster Russian capabilities and commitments to operate the installed security systems. By developing regulations and procedures, training and equipment repair centers, a national accounting system, secure transportation of nuclear materials, and other operational support initiatives, the division is able to help the Russian Federation establish and implement national and other infrastructure components necessary to support MPC&A systems.
- ***The International Emergency Cooperation Division***[8] is working to ensure that foreign governments, international organizations and U.S. embassies have adequate and effective nuclear emergency assistance. The assistance addresses the planning and operational aspects of emergency preparedness. In addition the Division manages the DOE Nuclear Assessment Program which tracks and assesses nuclear smuggling and threat cases.

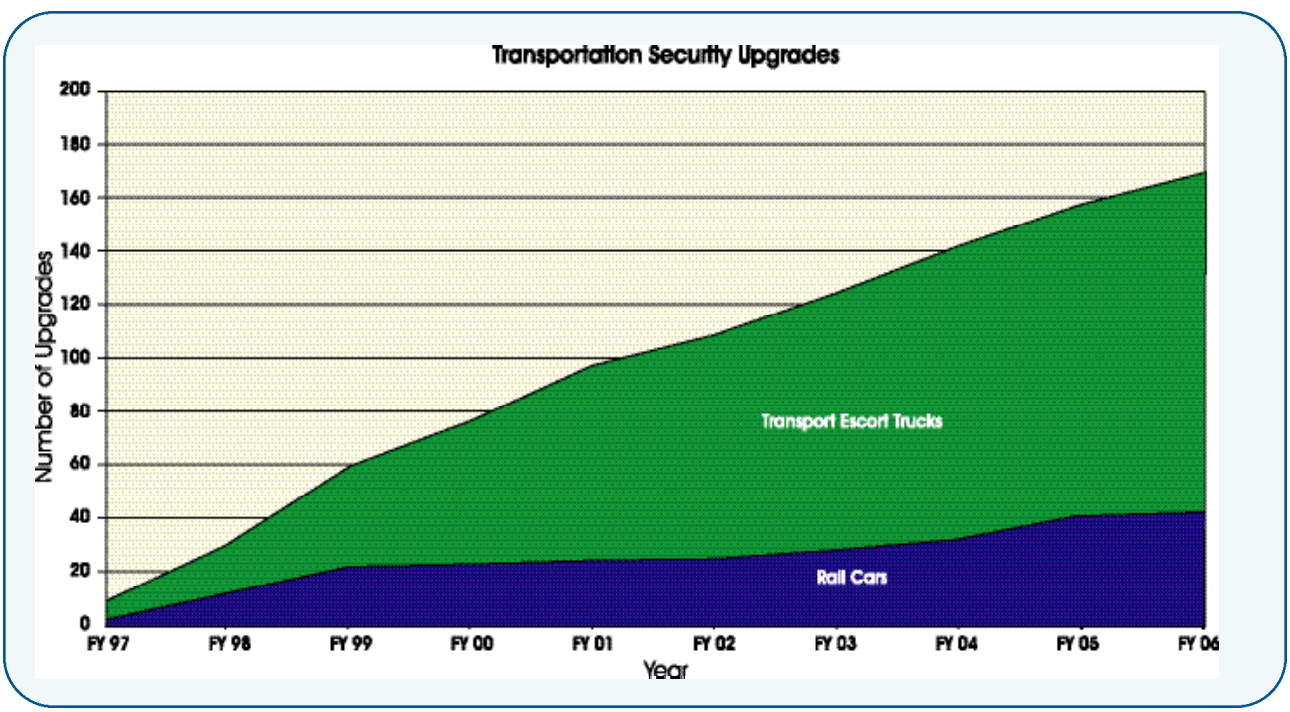


Figure 5. Transportation Security Upgrades

[8] The International Emergency Cooperation Division's activities are outside the scope of this Strategic Plan, which is focused on MPC&A Program activities.

SECURITY PRIORITIES —
Low Tech, Low Cost, High Payoff

DOE Headquarters manages the MPC&A Program, and provides funding for MPC&A improvements at Russian sites through direct contacts between its headquarters staff, national laboratories and Russian sites. Project teams consisting of security experts from DOE headquarters, national laboratories, and contractors work with their Russian counterparts to design and install improved MPC&A systems. In December 1998, DOE issued "Guidelines for Material Protection, Control and Accounting Upgrades at Russian Facilities." This internal guidance document, which was updated in July 2001, provides project teams with a systematic and cost-effective criteria for planning and prioritizing security upgrades to reduce the risk of theft. The criteria establish program priorities based on "proliferation attractiveness" —how easily nuclear material can be converted to weapons. The guidance instructs project teams to focus on simple, cost-effective MPC&A upgrades with a philosophy of focusing resources on upgrades closest to the target material first. Finally, the criteria emphasizes the need for multiple components that minimize the reliance on any one failure.

In conjunction with the MPC&A guidelines, DOE established a Technical Survey Team, consisting of MPC&A technical experts from the national laboratories and the private sector. The Team conducts annual reviews of all projects to determine if planned or installed MPC&A systems are consistent with DOE guidelines. The Team performs its reviews by examining project documentation and meeting with the project team. Based on the Technical Survey Team reviews, DOE Headquarters may issue guidance to individual project teams to take corrective actions.

Accomplishments

The MPC&A Program has achieved significant accomplishments in reducing the threat to U.S. national security. By the end of FY 2001 the MPC&A Program will have:

- Completed comprehensive upgrades at 38 sites.
- Completed rapid upgrades on 37% of the roughly 603MTs of at-risk HEU and Plutonium.
- Completed comprehensive upgrades on 18% of the at-risk material.
- Completed rapid upgrades on 91% of the estimated 4,000 at-risk Russian Navy nuclear warheads.
- Completed comprehensive upgrades on 17% of the at-risk Russian Navy warheads.
- Eliminated more than 2.9 MTs of HEU by converting it to LEU.
- Removed all weapons-usable material from 21 buildings and consolidated it into fewer locations thus improving security and saving costs.
- Conducted 45 joint US-Russian operational inspections and performance testing of installed systems.
- Enhanced security features of 74 transport and escort trucks, 25 railcars, and provided 101 secure overpacks thus improving security during transport.
- Provided training for over 4,000 Russian MPC&A operators and managers.
- Created capability for 14 Russian sites to report full inventory data to the Federal Information System (FIS).
- Completed 4 centers for MPC&A personnel training and education, and equipment support.
- Developed 30 federal MPC&A regulations which form the legal basis and requirement for upgraded nuclear material security.

These achievements underscore the MPC&A Program's strong contribution to U.S. national security and its progress toward reducing the proliferation threat. However, much work remains to be done.

Steel-clad, reinforced concrete blocks placed above PuO_2 canisters to deter easy access.

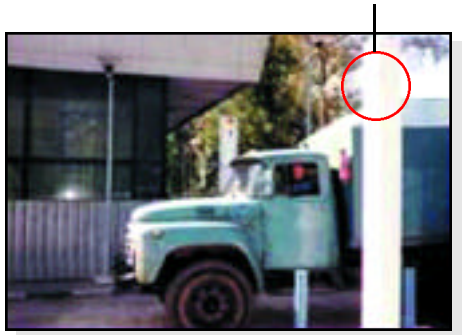
Low tech security options include steel cages that hold fissile material.

UPGRADES STRATEGY — *Low Tech, Low Cost, High Payoff*

To reduce the risk of theft of nuclear materials in as short a period of time as possible, the MPC&A Program has adopted a phased upgrades approach whereby rapid security upgrades are employed at a site in the immediate term in conjunction with the implementation of comprehensive upgrades over the longer term.

Rapid upgrades focus on basic upgrades that can be completed within the first 6–12 months of the start of cooperation with a particular site and may include:

- Creating clear zones around key facilities and establishing controlled areas to limit access to those facilities or storage locations.
- Bricking up windows, hardening doors, installing locks, and adding delay blocks and steel cages at nuclear material storage locations.
- Installing portal monitors, implementing two-person access rule, and instituting random guard patrols and daily administrative checks at nuclear material storage locations.
- Conducting baseline inventories and installing tags, seals, and tamper indicating devices to detect unauthorized removal of nuclear material.



Vehicle portal monitors are used at site entrances to detect special nuclear materials.

Comprehensive upgrades include electronic access control systems requiring two-person authorization.

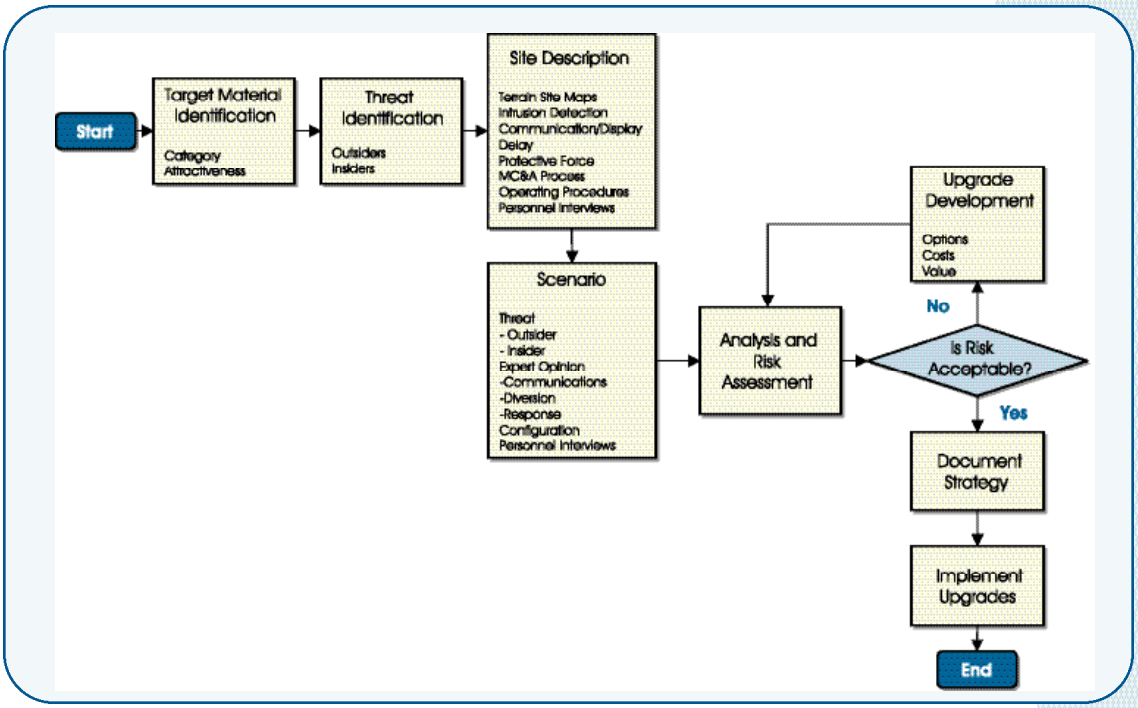
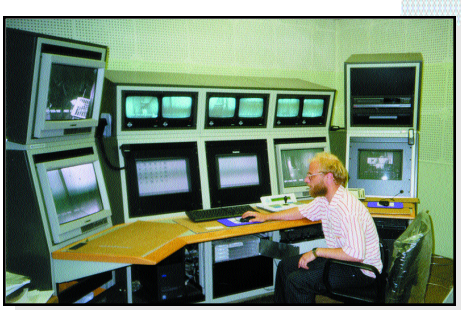


Figure 6. Systematic Upgrade Process

Comprehensive upgrades could take 18–24 months to complete depending on the size and complexity of the site and the resources the site can contribute to the upgrades effort. Comprehensive upgrades include:

- Rapid upgrades plus upgrades such as intrusive detection equipment, closed-circuit televisions (CCTV), alarm assessment systems, electronic access controls, barcode readers, and central alarm stations.
- Computerized material accounting systems.
- Advanced measurement systems.

Electronic barcode readers are used to track nuclear material items.



Central alarm stations are used for alarm detection and video assessment.

Four buildings at Luch hold nuclear material, consolidated from 14 buildings.

Video assessment equipment is used to increase security at Luch.

Luch Scientific Production Association

The first confirmed case of theft of nuclear materials in Russia occurred in 1992 at the Luch Scientific Production Association 35 miles south of Moscow when Leonid Smirnov, an employee of the site, stole approximately 1.5 KGs of HEU. However, today the Luch site exemplifies successful U.S.-Russia cooperation to reduce the threat of nuclear terrorism. The MPC&A upgrades process taken at the Luch Scientific Production Association is consistent with the upgrades philosophy of the MPC&A program. When cooperation first began with the Luch site in 1995, consolidation plans were developed and executed based on the attractiveness and location of nuclear materials. The number of nuclear material storage buildings was reduced from 14 to 4. Vulnerability assessments were then conducted and MPC&A upgrade strategies were developed for the remaining nuclear material storage areas.

A graded safeguards approach was employed focusing on the most attractive material first, installing upgrades at the target materials and moving outward, and providing protection in-depth (concentric rings of security). Rapid upgrades were initiated first including the installation of brick windows, hardened doors, locks, and man traps at the four buildings where nuclear material was consolidated. Additionally, rapid MC&A upgrades were implemented including the installation of portal monitors and tamper indicating devices and the implementation of two person access rule, daily administrative checks at nuclear material storage locations and baseline inventories of nuclear materials on site.

MPC&A upgrades to the primary storage location, the Central Storage Facility, were completed in November 1998. Comprehensive upgrades at Luch are expected to be completed in mid-2002. These upgrades include intrusion detection equipment, close circuit televisions, automated access controls, central alarms stations for alarm communication and display, non-destructive measurement equipment to measure quantity of HEU, and electronic scales. A computerized material accounting system is being deployed at Luch because the site has a significant amount of material and dynamic processes.

Luch has also taken on an important leadership role with the efforts to reduce the scope of the problem Russia-wide under the Material Consolidation and Conversion initiative. Luch has been designated by MinAtom as one of two sites to convert HEU to LEU under this program.

MATERIAL CONSOLIDATION AND CONVERSION (MCC) STRATEGY

The MCC program seeks to reduce the number of potential theft targets by consolidating material into fewer buildings at fewer sites and by converting excess HEU to LEU. Phase I of the program began in May 1999 and included contracting with Luch to down-blend HEU to LEU for the first time under the "Model Project," which ran until January 2000. Luch downblended approximately 235 kg of proliferation attractive HEU (192 kg of U-235), including more than 100 kg of HEU moved from Lytkarino, a site in the Moscow region with highly attractive material and minimal MPC&A upgrades.

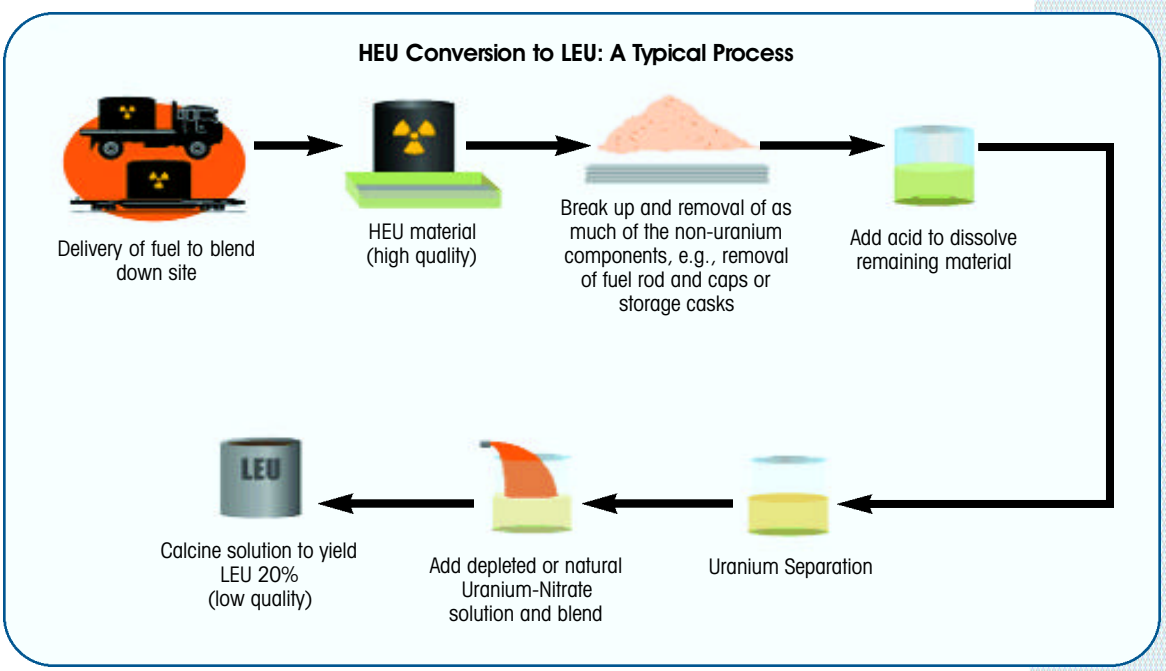


Figure 7. HEU Conversion Process

As apart of the MCC Project, Russian and U.S. team members confirm the HEU and LEU inventory.

Phase II began in February 2000 with the initiation of the "Pilot Project," which significantly increased the amount of HEU being downblended at Luch and involved a second downblending site, the Research Institute of Atomic Reactors (RIAR) in Dimitrovgrad, Russia. This phase will be extended to continue downblending activities until a formal US/Russian MCC Cooperation agreement is approved. By the end of FY01, approximately 2.9 MT of HEU will have been downblended. It is anticipated that up to 27 MT of HEU will be downblended by 2010.

The MCC program creates a legitimate market demand for excess Russian HEU, and is a cost-effective way of reducing the threat to U.S. national security. A legitimate demand for excess Russian HEU is created because Russian sites can earn funds by selling excess HEU to Luch or RIAR as opposed to criminals or terrorist groups. Security costs will be reduced over the long term by the removal of all nuclear materials of proliferation concern from sites, thus reducing U.S. MPC&A support requirements and increasing security. The program consists of extensive monitoring regimes in place at pilot facilities. The most attractive nuclear materials are being eliminated first and the Program does not pay for downblended facilities or equipment. Building upon the "Pilot Project" successes, consolidation and conversion can expand significantly in the next few years.

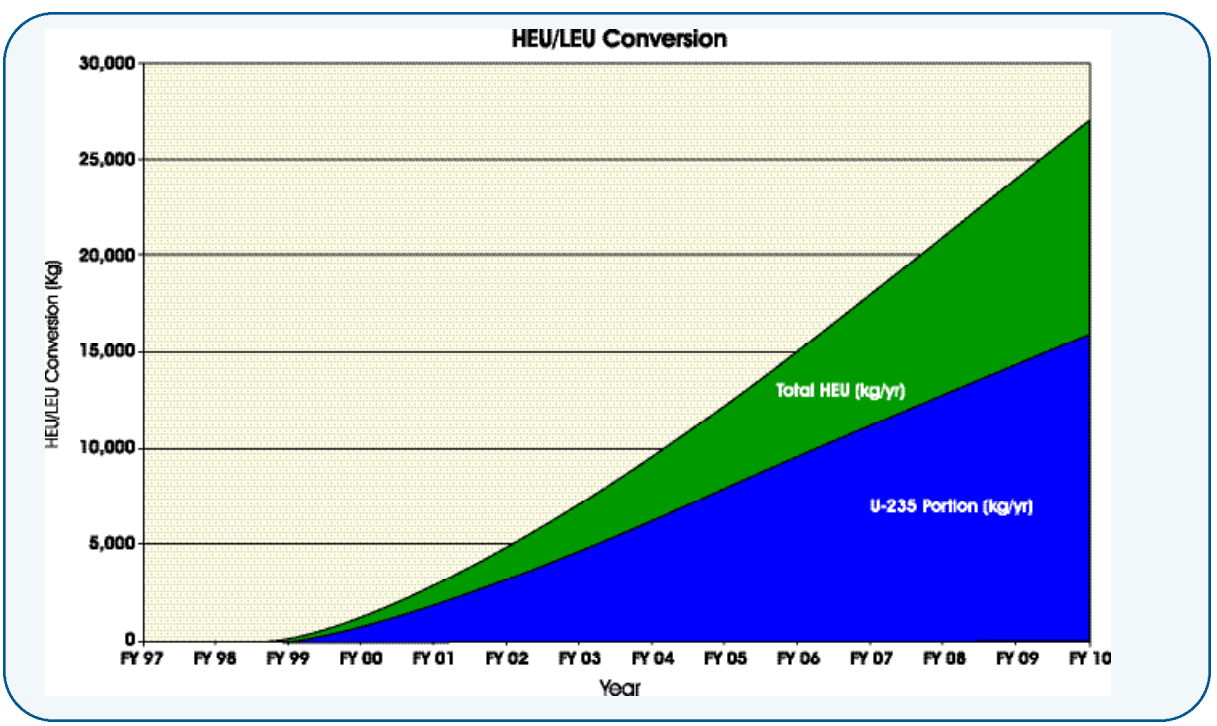


Figure 8. HEU/LEU Conversion

OPERATIONS AND EXIT STRATEGY

While the completion of MPC&A upgrades at Russian sites is important, it is equally important that Russian sites operate and maintain these systems over the long term. The MPC&A Program has taken steps to establish a comprehensive program to foster Russian ability and commitment to operate and sustain installed MPC&A systems that include:

- The development of standard MPC&A regulations and procedures;
- The establishment of Russian MPC&A Training and equipment repair Centers;
- Creation of a national level nuclear materials accounting system;
- Provision for site system maintenance, warranties and spare parts; and
- Enhancement of inspection capabilities, protective forces and performance testing programs.

"We recognize the resources required to transform and safeguard Russia's nuclear weapons establishment… has to be a Russian responsibility. But we can show the way. We can be a catalyst. And we can demonstrate what is possible to Russians and to business communities."

General John Gordon, Administrator of National Nuclear Security Administration (NNSA)

Russian site employees receive MPC&A training at the Russian Methodological Training Center in Obninsk.

Security systems are only as effective as the people who operate and maintain them. MPC&A cooperation provides assistance to Russian protective forces to improve the ability to operate, maintain, and respond to the installed MPC&A systems.

The MPC&A Program is also developing an Exit Strategy whose goal is to ensure that Russia continues to operate and sustain installed MPC&A systems over the long-term once DOE assistance has ended. The elements of the Exit Strategy include:

- An MPC&A operations criteria document that provides guidance to project teams to take specific steps to transistion from U.S. support to full Russian ownership and operation of MPC&A systems.
- Development of site specific analysis of MPC&A system and personnel operational costs and abilities to operate and sustain MPC&A upgrades.
- Site specific exit plans to foster full and effective Russian ownership and support of MPC&A operations and U.S. withdrawl of support.
- Joint review visits by U.S. and Russian government representatives to ensure sites are operating and maintaining MPC&A systems.
- The installation of unattended monitoring systems that will allow Russian and U.S. government officials to ensure sites continue to operate MPC&A systems on an ongoing basis.

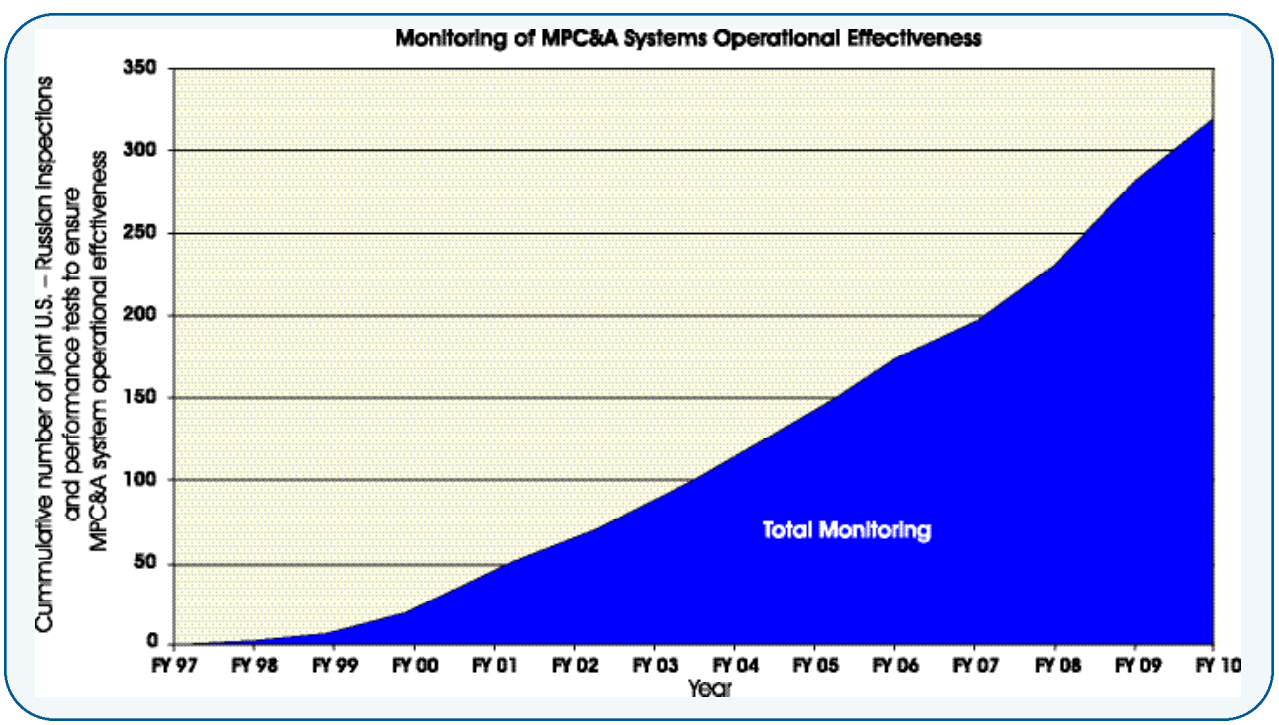


Figure 9. Monitoring of MPC&A Systems Operational Effectiveness

PROGRAM MANAGEMENT —
Threat Reduction Done Cost Effectively

To ensure that MPC&A Program funds are used in the most effective and efficient manner, DOE has established a number of project management processes and requirements.

Headquarters federal managers provide oversight of all MPC&A Project teams. Drawing upon the best practices of successful public and private programs, the MPC&A Program has developed an extensive set of managerial practices and the following specific project control guidelines:

- ***Project Work Plans*** – All project teams maintain Project Work Plans authorized by DOE Headquarters that include project scope, schedule, tasks and budget. The Project Work Plans are revised at least annually or more often as changes in scope occur.
- ***Funds Management*** – DOE funds are appropriated by Congress each fiscal year and are distributed to the various national laboratories. Funds are allocated by project and follow the Project Work Plans. Changes in fund allocations are approved by DOE. Financial reporting by each national laboratory is conducted on a monthly basis. Cost elements reported include U.S. labor, U.S. travel, U.S. equipment/materials, U.S. laboratory overhead on Russian equipment and contracts, Russian equipment/services, Russian travel, and commitments.
- ***Assurances*** – Semi-annual DOE MPC&A Assurance Reports provide certification that all elements of the Program are being executed in an effective and economic manner and that the equipment, material, funding, contracts, training and other services are accounted for and are being used for their intended purposes.
- ***Access*** – In January 2000, new guidance was issued to project teams on required access to implement MPC&A upgrades at Russian nuclear sites. Physical access is the preferred means to identify nuclear material that needs protection and to design and install MPC&A systems.
- ***Travel*** – The MPC&A Program has established a Travel Information System to track all foreign travel requests for the MPC&A Program. Much of the required information for country clearance cables, letters of invitation and travel requests can be entered at the laboratory and electronically approved at Headquarters by appropriate officials.
- ***Export Controls*** – MPC&A has established an Internal Control Program to ensure that its program is implemented in full compliance with all existing U.S. export control policies.

"We can spend resources today to eliminate the threat at its source, or we will be forced to spend much more tomorrow to defend ourselves from weapons and technology after they have proliferated."

Senator Richard Lugar

Sites of MPC&A Cooperation

MinAtom Weapons Complex

1. Arzamas-16, Sarov, All-Russian Scientific Research Institute of Experimental Physics (VNIIEF)
2. Chelyabinsk-70, Snezhinsk, All-Russian Scientific Research Institute of Technical Physics (VNIITF)
3. Chelyabinsk-65, Ozersk, Mayak Production Association
4. Sverdlovsk-44 (S-44), Urals Electrochemical Integrated Plant (UEIP)
5. Tomsk-7, Siberian Chemical Combine (SCC)
6. Krasnoyarsk-26, Zheleznogorsk, Mining and Chemical Combine (MCC)
7. Krasnoyarsk-45, Zelenogorsk, Electrochemical Plant (ECP)
8. Avangard Electrochemical Plant
9. Sverdlovsk-45, Lesnoy
10. Penza-19, Zarechnyy

Russian Civilian Sites

12. Institute of Physics and Power Engineering (IPPE), Obninsk
13. Bochvar All-Russian Scientific Research Institute of Inorganic Materials (VNIINM)
14. Elektrostal Production Association Machine Building Plant (POMZ)
15. Scientific Production Association Luch, Podolsk
16. Scientific Research Institute of Atomic Reactors (NIIAR), Dimitrovgrad
17. Novosibirsk Chemical Concentrates Plant (NCCP)
18. Khlopin Radium Institute (KRI)
19. Krylov Shipbuilding Research Institute
20. Petersburg Nuclear Physics Institute (PNPI)
21. Joint Institute of Nuclear Research (JINR), Dubna
22. Karpov Institute of Physical Chemistry
23. Moscow Institute of Theoretical and Experimental Physics (ITEP)
24. Moscow State Engineering Physics Institute (MEPhI)
25. Scientific Research and Design Institute of Power Technology (RDIPE)
26. Lytkarino Research Institute of Scientific Instruments (RISI)
27. Beloyarsk Nuclear Power Plant (BNPP)
28. Sverdlovsk Branch of Scientific Research and Design Institute of Power Technology (SF-NIKIET)
29. Tomsk Polytechnic University (TPU)

Naval Complex

Murmansk Vicinity

30	CBC A1	40	CBC C1
31	CBC A2	41	CBC C2
32	CBC A3	42	CBC C3
33	CBC A4	43	PBZ C1
34	CBC A5	44	PBZ C2
35	CBC A6	45	PBZ-C3
36	PBZ A1	46	CBC D1
37	CBC B1	47	CBC E1

Vladivostok region

49	CBC P1	55	CBC P3-3
50	CBC P2	56	CBC P3-4
51	CBC P2-2	57	CBC P4
52	CBC P2-3	58	CBC P5
53	CBC P3	59	CBC P6
54	CBC P3-2	60	CBC P7

Petropavlovsk-Kamchatskiy region

61	CBC K1	67	CBC K4
62	CBC K2	68	CBC K5
63	CBC K3	69	CBC K6
64	CBC K3-2	70	PBZ K1
65	CBC K3-3	71	PBZ K2
66	CBC K3-4		

72	Icebreaker Fleet, Murmansk
73	PM-12 Refueling Ship, Murmansk
74	PM-63 Refueling Ship, Severodvinsk
75	PM-74 Refueling Ship, Vladivostok
76	Navy Site 49, Murmansk
77	Navy Site 32, Vladivostok
78	Navy Site 34, Vladivostok
79	Navy Site 86, Vladivostok
80	Sevmash Shipyard
81	Sergiev Posad
82	Kurchatov Institute

NIS and the Baltics

83	Salaspils Institute of Nuclear Physics, Latvia
84	Ignalina Nuclear Power Plant, Lithuania
85	SOSNY Institute of Nuclear Power Engineering, Minsk, Belarus
86	Kiev Institute of Nuclear Research, Ukraine
87	Kharkiv Institute for Physics and Technology, Ukraine
88	South Ukraine Nuclear Power Plant
89	Sevastopol Institute for Nuclear Energy and Industry, Ukraine
90	Tbilisi Institute of Physics, Georgia
91	BN-350 Breeder Reactor, Aktau, Kazakhstan
92	Kurchatov Institute of Atomic Energy, Kazakhstan
93	Ulba Metallurgical Plant, Ust-Kamenogorsk, Kazakhstan
94	Institute of Atomic Energy, Alatau, Kazakhstan
95	Institute of Nuclear Physics, Tashkent, Uzbekistan

Russian map B3/A ROADS/RR 4/3/01

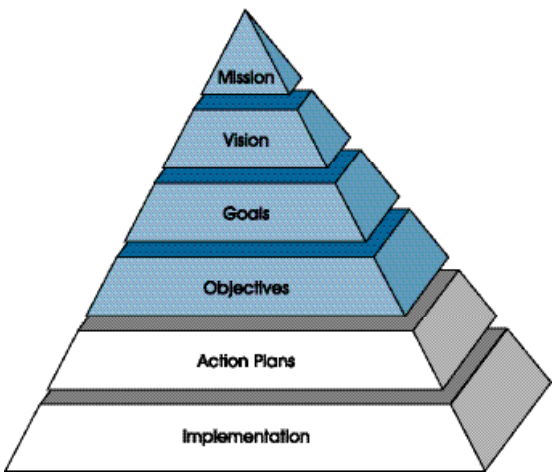


Figure 10. Strategic Planning Model

UPDATING THE STRATEGIC PLAN

This section presents the updated mission, vision, goals, and objectives for the MPC&A Program—those elements of the Strategic Plan that will guide our future activities and provide organizational and programmatic focus. This section also contains a discussion of additional factors driving the new MPC&A Program direction, including Program customers and stakeholders, and important elements of the external environment.

The MPC&A Program undertook this strategic planning effort for several critical reasons. First, strategic planning provides organizational focus and establishes priorities. Second, the previous MPC&A Strategic Plan was published in January 1998; an updated plan is appropriate given changes in Program scope and focus. The MPC&A Program has undergone major expansion in its cooperation with the Russian Navy, the initiation the MCC project with MinAtom, and the development of a Sustainability Program to ensure MPC&A systems are operated and maintained over the long term.

Additionally, some assumptions made prior to 1998 have changed. The number of locations where nuclear material is stored in Russia is larger than previously believed. U.S. and Russian technical experts are cooperating to install MPC&A systems at over 95 nuclear sites in Russia. Also, the economic downturn in Russia beginning in August 1998 and Russia's continued need to rationalize policies and procedures has forced the MPC&A Program to rethink assumptions on how soon the Russian authorities will be able to fund the operation and maintenance of MPC&A systems on their own. Russia's recent economic improvement has yet to provide any indication that Russia is better positioned financially to fully support MPC&A work.

STRATEGIC PLANNING PROCESS

The MPC&A Program followed a structured strategic planning model in developing this updated Strategic Plan.

In preparation for its revised strategic planning, the MPC&A Program conducted a series of Program-focused interviews with key Program participants, including representatives of the DOE laboratories and members of relevant Non-Governmental Organizations (NGOs) in addition to MPC&A leadership. The MPC&A Program then held a structured, multi-day off-site workshop to develop the content of the Plan.

During these activities, MPC&A strategic planning efforts were aligned with the DOE-wide Strategic Plan, as well as NNSA and NN strategy. The MPC&A Program is tied directly to the DOE mission and vision, and contributes most directly to the following DOE strategic goal,[9] as well as the NNSA mission:[10]

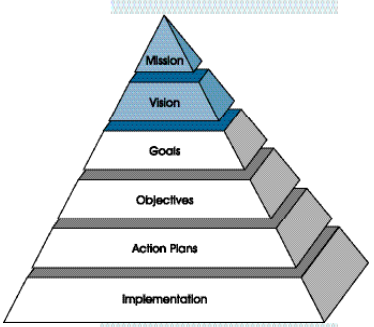
[9] Source: *September 2000 DOEStrategic Plan*
[10] Source: NNSA web site http://www.nnsa.doe.gov

MPC&A Program Alignment with DOE Strategic Plan	
Goal	**Objectives**
National Nuclear Security General Goal: Enhance national security through the military application of nuclear technology and reduce the global danger from weapons of mass destruction.	**NS1:** Maintain and refurbish nuclear weapons in accordance with directed schedules to sustain confidence in their safety, security, and reliability, indefinitely, under the nuclear testing moratorium and arms reduction treaties. **NS2:** Achieve the robust and vital scientific, engineering, and manufacturing capability that is needed for current and future certification of the nuclear weapons stockpile and the manufacture of nuclear weapon components under the nuclear testing moratorium. **NS3:** Ensure the vitality and readiness of DOE's national nuclear security enterprise. **NS4:** Reduce the global danger from the proliferation of weapons of mass destruction (WMD). **NS5:** Provide the U.S. Navy with safe, militarily effective nuclear propulsion plants, and ensure their continued safe and reliable operation. **NS6:** Ensure that the Department's nuclear weapons, materials, facilities, and information assets are secure through effective safeguards and security policy, implementation, and oversight.

MPC&A Program Alignment with NNSA Strategy
NNSA Mission Statement
The mission of the Administration shall be the following:
1. To enhance United States national security through the military application of nuclear energy.
2. To maintain and enhance the safety, reliability, and performance of the United States nuclear weapons stockpile, including the ability to design, produce, and test, in order to meet national security requirements.
3. To provide the United States Navy with safe, militarily effective nuclear propulsion plants and to ensure the safe and reliable operation of those plants.
4. To promote international nuclear safety and nonproliferation.
5. To reduce global danger from weapons of mass destruction.
6. To support United States leadership in science and technology.

MPC&A PROGRAM MISSION

To support U.S. national security objectives by enhancing the protection of international nuclear weapons and weapons-usable nuclear material at high risk of theft or diversion.[11]



MPC&A PROGRAM VISION

The U.S. Government leader, channeling our expertise and resources in reducing the risk to U.S. national security through:

- Achieving substantially improved overall protection of nuclear weapons and weapons-usable nuclear materials in Russia or other nations desiring such expertise if that serves U.S. nonproliferation objectives
- Fostering Russian commitment to ensuring long-term nuclear material security
- Actively engaging additional partner countries needing technical assistance and support while forming partnerships with other countries and international organizations on MPC&A work
- Maintaining a highly effective and dedicated professional staff.

[11] The Program's mission is national security oriented and does not address safety, sabotage, or the environment.

PROGRAM CUSTOMERS, STAKEHOLDERS, AND THE EXTERNAL ENVIRONMENT

Customers & Stakeholders

The MPC&A Program provides benefits to a broad spectrum of people and groups. The primary customer the Program serves, however, is the U.S. public, as represented by the President, Congress, and DOE/NNSA Management. The Program must be responsive to customer needs for protection against the proliferation threat, as well as ensuring that Program funds are efficiently spent for the purpose for which intended.

In addition, there are a variety of key stakeholder groups that are critical to the success of the Program. These groups include: International partners such as the Russians, the DOE Laboratories, Non-Governmental Organizations (NGOs), and the U.S. interagency.

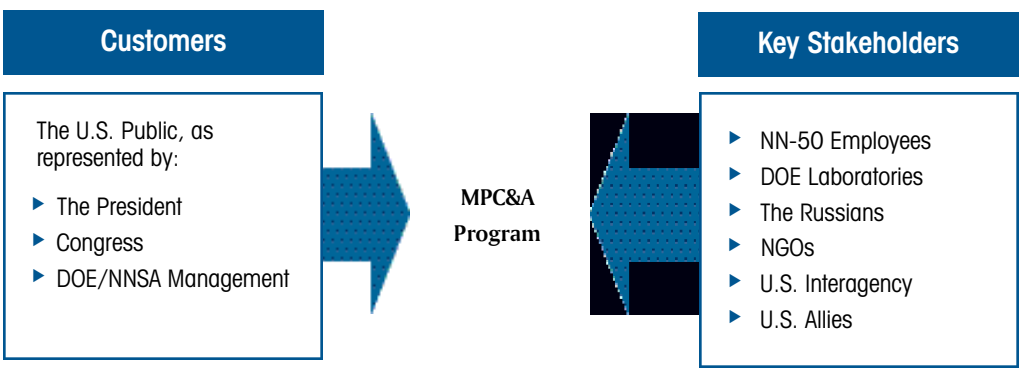


Figure 11. MPC&A Program Customers and Stakeholders

External Environment

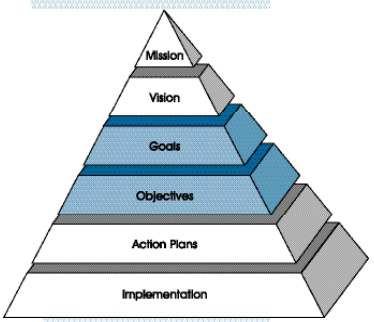
The MPC&A Program faces a changing external environment, which was also considered during the planning process. For example, the number of locations where nuclear material is stored in Russia is considerably larger than the Program's original estimates. U.S. and Russian technical experts are cooperating to install MPC&A systems at over 95 nuclear sites in Russia. This nearly doubles the initial Program estimate of 50 nuclear sites. As a result of limited access in some areas and limited information at the larger sites, especially MinAtom's "Closed Cities," the U.S. still may not fully understand the scope of the problem.

In addition, the economic downturn in Russia beginning in August 1998 has forced the MPC&A Program to rethink assumptions on how soon the Russian nuclear sites will be able to fund the operation and maintenance of MPC&A systems on their own. Original assumptions included the idea that a number of "model" MPC&A systems would be installed that the

Russians would then replicate on their own, and that the Russians would have the funds to pay for personnel to operate the systems, maintenance costs, spare parts and system improvement as needed. Based on the assumption that the Russian economy would eventually stabilize and enjoy growth, the Program initially focused on higher technology solutions. Today it seems clear that despite some recent Russian economic improvement caused largely by rising energy prices, it will take many more years for Russian economic conditions to improve to the point where the Russians can fully finance the continued operation and sustainability of upgraded MPC&A systems.

GOALS AND OBJECTIVES

Based on its mission and vision, the MPC&A Program developed five strategic goals, and corresponding objectives, that will guide Program focus:



Goals	Objectives
GOAL 1. Assist Russia and, as necessary, other nations, in improving the security of nuclear weapons and weapons-usable nuclear material at high risk of theft or diversion.	Objective 1.A. Identify vulnerable nuclear weapons and weapons-usable nuclear material, and assess the level of risk. Objective 1.B. Implement appropriate and sustainable physical security and materials accountancy upgrades. Objective 1.C. Consolidate nuclear weapons and weapons-usable nuclear material into fewer buildings and at fewer sites. Objective 1.D. Convert excess weapons-usable nuclear material to a non-usable form.
GOAL 2. Assist Russia in enhancing capabilities and commitment to operating and maintaining improved nuclear security.	Objective 2.A. Develop clear incentives and disincentives to ensure partners meet MPC&A agreements and nonproliferation obligations. Objective 2.B. Foster the development of regulatory institutions, regulations, procedures, and training centers within partner countries. Objective 2.C. Develop an outreach strategy to enhance partner countries' awareness and understanding of threats and MPC&A benefits. Objective 2.D. Determine level of sustainability assistance required to transition full operations and maintenance of MPC&A equipment to partner countries.
GOAL 3. Establish and maintain a collaborative environment with Program customers and stakeholders.	Objective 3.A. Establish clear and ongoing communication channels with Program customers. Objective 3.B. Increase collaboration and communication with current stakeholders. Objective 3.C. Develop and implement communication strategies with key new international stakeholders (in addition to the Russians).
GOAL 4. Manage Program resources responsibly in order to ensure efficient and effective Program implementation.	Objective 4.A. Institutionalize and apply strong program and project management practices to all MPC&A activities. Objective 4.B. Develop and adopt standardized measures of Program progress and effectiveness. Objective 4.C. Improve Program business processes.
GOAL 5. Develop a comprehensive Human Resources strategy to continuously improve Program capability.	Objective 5.A. Develop and implement comprehensive Human Resources policies and procedures. Objective 5.B. Develop and implement strategies for recruitment and retention of qualified staff. Objective 5.C. Establish and implement systematic training programs to address key programmatic skills. Objective 5.D. Improve working conditions.

Goal 1

Assist Russia, and, as necessary, other nations, in improving security of nuclear weapons and weapons-usable nuclear material at high risk of theft or diversion.

Objectives:

Objective 1.A. Identify vulnerable nuclear weapons and weapons-usable nuclear material, and assess the level of risk.

Objective 1.B. Implement appropriate and sustainable physical security and materials accountancy upgrades.

Objective 1.C. Consolidate nuclear weapons and weapons-usable nuclear material into fewer buildings and at fewer sites.

Objective 1.D. Convert excess weapons-usable nuclear material to a non-usable form.

Purpose of Goal & Objectives:

This goal and its objectives target the primary elements of the Program's mission: reducing risk by improving security over nuclear weapons and weapons-usable nuclear material. Identifying vulnerable materials is a prerequisite to installing any type of security upgrades. While much is known about the size and condition of the Russian nuclear complex, there is still uncertainty about its exact scope and state.

In addition, the Program always endeavors to implement the "right" upgrades. This includes implementing upgrades appropriate to the type and quantity of the material and the level of risk of theft or diversion, as well as upgrades that partner countries can operate and maintain themselves to ensure enduring, or sustainable, security.

Finally, consolidation and conversion of materials is a critical component of improving security and contributes to wise use of Program funds. If materials are consolidated, e.g., the number of storage buildings and storage facilities are reduced, then fewer buildings and facilities will require physical upgrades. Similarly, materials that are converted to non-weapons-usable forms do not need the same level of protection.

Cooperative agreements with prospective partner countries, particularly about the level of access and assurance (e.g., capability to ensure that upgrades are functioning properly post-installation) acceptable to both parties, is an important element in achieving this goal and its objectives.

As part of our activities under this goal category, we will develop and update, as needed and in accordance with current strategy and NNSA objectives, options for completing the Program based on progress made on gaining access to sensitive sites and closure of buildings and sites.

Goal 1 Measures of Success

Goal/Objectives	Measures of Success
GOAL 1.	▸ **Percentage of sites/buildings with rapid and comprehensive MPC&A upgrades** ▸ **Percentage of total nuclear weapons and nuclear material under MPC&A upgrades** ▸ **Amount of nuclear material consolidated/converted** ▸ **Number of buildings/sites cleared of nuclear material** ▸ **Relative risk reduction**
Objective 1.A.	▸ Number and/or quality of agreements with partner countries on access and assurance ▸ Number of sites, buildings, and material where cooperation is under way ▸ Amount of material identified ▸ Risk classification of identified material
Objective 1.B.	▸ Number of buildings/sites at which upgrades have begun (rapid vs. comprehensive) ▸ Number of buildings/sites at which upgrades have been completed (rapid vs. comprehensive) ▸ Amount of material secured ▸ Appropriateness of upgrades (given the level of threat and attractiveness of the material) ▸ Relative risk reduced
Objective 1.C.	▸ Number of sites/buildings closed or reduced ▸ Amount of material consolidated ▸ Relative risk reduced
Objective 1.D.	▸ Amount of material converted ▸ Relative risk reduced

Goal 2

Assist Russia in enhancing capabilities and commitment to operating and maintaining improved nuclear security.

Objectives:

Objective 2.A. Develop clear incentives and disincentives to ensure partners meet MPC&A agreements and nonproliferation obligations.

Objective 2.B. Foster the development of regulatory institutions, regulations, procedures, and training centers within partner countries.

Objective 2.C. Develop an outreach strategy to enhance partner countries' awareness and understanding of MPC&A benefits.

Objective 2.D. Determine level of sustainability assistance required to transition full operations and maintenance of MPC&A equipment to Russia.

Purpose of Goal & Objectives:

Ultimate success will only be achieved when countries such as Russia are fully capable of operating and maintaining effective security over their nuclear weapons and weapons-usable nuclear material. This goal and its accompanying objectives are designed to help position these countries to take over remaining work.

For example, for the Program to achieve its mission, Russian sites require not just equipment and our expertise to upgrade their MPC&A systems. They also must operate the systems in an optimal manner; be staffed by personnel who are trained to operate and maintain the upgraded systems; have an adequately trained and staffed guard force; and have the funds for personnel, maintenance, and spare parts to sustain the systems over the long term.

Currently, there is no indigenous structure in place to provide the incentives, resources, and organizational infrastructure for Russia to maintain high levels of security on its own.[12]

In addition, an outreach strategy will help foster a positive attitude toward and ownership of MPC&A.

Finally, responsibility for full operations and maintenance of MPC&A equipment must be transitioned to Russia. This will include a comprehensive review and analysis of each MPC&A site, in order to: establish a specific cost for operating and maintaining MPC&A equipment; identify which fraction of those costs will require U.S. financial support; and develop a plan to transition all support from U.S. to partner countries' sources as quickly as possible.

Goal 2 Measures of Success

Goal/Objectives	Measures of Success
GOAL 2.	▸ **Performance testing results** ▸ **Post-upgrade assessment ratings of operation/sustainment of MPC&A upgrades** ▸ **Number of corrective actions as a result of regulatory inspections/oversight** ▸ **Relative risk reduction**
Objective 2.A.	▸ Number or percentage of contract deliverables partner countries complete on time, within budget, and that satisfy requirements
Objective 2.B.	▸ Number of rules/regulations the Program has helped partner countries develop and implement ▸ Assessment of the effectiveness of partner countries' rules/regulations
Objective 2.C.	▸ Amount of Russian funding committed to MPC&A
Objective 2.D.	▸ Number of site cost analysis reviews completed

12 "A Report Card on the Department of Energy's Nonproliferation programs with Russia," Secretary of Energy Advisory Board, January 10, 2001.

Goal 3

Establish and maintain a collaborative environment with Program customers and stakeholders.

Objectives:

Objective 3.A. Establish clear and ongoing communication channels with Program customers.

Objective 3.B. Increase collaboration and communication with current stakeholders.

Objective 3.C. Develop and implement communication strategies with key new international stakeholders (in addition to the Russians).

Purpose of Goal & Objectives:

The Program must communicate well with its primary customers—the U.S. Public, as represented by the President, Congress, and NNSA management. In its recent report, the Secretary of Energy Advisory Board found the public to be, in general, unaware of the magnitude and importance of the threat of unsecured nuclear weapons and weapons-usable nuclear material.[13]

In addition, the Program cannot be effectively implemented without the active participation of a number of key stakeholders, such as the DOE Laboratories and the Russians. Clear communication and an environment of partnership is necessary to make this happen. Further, there are a broad variety of U.S. Government programs conducting international nonproliferation activities. Increased communication and collaboration between the MPC&A Program and other nonproliferation programs is to everyone's benefit.

Finally, awareness of the threat of unsecured materials and the benefits of MPC&A should be clearly communicated to additional international stakeholders.

Goal 3 Measures of Success

Goal/Objectives	Measures of Success
GOAL 3.	▸ **Customer/stakeholder satisfaction/approval ratings** ▸ **Percentage of positive documented statements about the Program by external stakeholders** ▸ **Development and execution of annual communications strategy**
Objective 3.A.	▸ Development and execution of a customer communication strategy ▸ Amount of program funding ▸ Content of Congressional correspondence and hearings ▸ Nature of media coverage
Objective 3.B.	▸ Satisfaction rating from periodic surveys of program participants ("staff") from NN-50 and laboratories ▸ Feedback from Russians ▸ Number of Russian requests for additional technical assistance
Objective 3.C.	▸ Development and execution of communication strategy for new International stakeholders ▸ Number of requests for technical assistance from new partner countries

[13] "A Report Card on the Department of Energy's Nonproliferation programs with Russia," Secretary of Energy Advisory Board, January 10, 2001.

Goal 4

Manage Program resources responsibly in order to ensure efficient and effective Program implementation.

Objectives:

Objective 4.A. Institutionalize and apply strong program and project management practices to all MPC&A activities.

Objective 4.B. Develop and adopt standardized measures of Program progress and effectiveness.

Objective 4.C. Improve Program business processes.

Purpose of Goal & Objectives:

The Program has a duty to the public and its representatives to provide wise stewardship of Program resources. Funds must be spent on appropriate activities, while also ensuring that timelines and budgets for specific projects are met. The Program has already taken critical steps to standardize program and project management practices, but additional efforts in these areas will provide even greater assurance that the Program continues to operate in a resource-responsible manner.

The Program has some well-established measures of success, such as the amount of material protected: new metrics will be assessed to determine if they help provide a gauge of overall Program results.

Improving business processes—for example, reducing delays in the travel process—will also help ensure efficient and effective Program implementation.

Goal 4 Measures of Success

Goal/Objectives	Measures of Success
GOAL 4.	▸ **Percentage/nature of Program overhead** ▸ **Percentage of committed/costed funds**
Objective 4.A.	▸ Number and percentage of projects completed on time and on budget ▸ Assessment of degree to which established guidelines are followed ▸ Spot checks of assurance reports and quarterly reports against project progress
Objective 4.B.	▸ Development of metrics
Objective 4.C.	▸ Number of delayed trips decrease ▸ Number of days to approve trip decreases

Goal 5

Develop a comprehensive Human Resources strategy to continuously improve Program capability.

Objectives:

Objective 5.A. Develop and implement comprehensive Human Resources policies and procedures.

Objective 5.B. Develop and implement strategies for recruitment and retention of qualified staff.

Objective 5.C. Establish and implement systematic training programs and train staff to improve key skills.

Objective 5.D. Improve working conditions.

Purpose of Goal & Objectives:

The Program's most valuable asset is its dedicated and professional staff. Given the specialized knowledge required for much of the Program's work, there is a relatively limited pool of resources from which to draw qualified staff. To ensure that the Program has the proper mix of skilled personnel moving forward, several areas of personnel management must be targeted simultaneously.

Continuing development of comprehensive human resources policies and procedures will provide the foundation for overall workforce management. Systematic training programs are necessary to ensure that all staff have the same basic tools necessary to effectively and efficiently conduct their activities. Finally, addressing issues related to working conditions will not only help with employee retention, but will also foster job satisfaction and motivation—additional keys to an efficient and effective workforce.

Goal 5 Measures of Success

Goal/Objectives	Measures of Success
GOAL 5.	▸ **Employee satisfaction survey results** ▸ **Attrition/turnover rates** ▸ **Average length of time to fill vacancies**
Objective 5.A.	▸ Employee satisfaction survey results
Objective 5.B.	▸ Attrition/turnover rates ▸ Average length of time to fill vacancies
Objective 5.C.	▸ Annual skills assessment results
Objective 5.D.	▸ Employee satisfaction survey results ▸ Additional professional space for staff

Appendix A
Glossary of Terms

MPC&A TERMS

Comprehensive MPC&A Upgrades—After rapid upgrades (please see "Rapid MPC&A Upgrades"), additional upgrades are installed to provide for more in-depth protection and accounting of material. These include interior and exterior detection systems and computerized accounting and measurement systems.

DOE—Department of Energy.

Downblending—The process of blending highly enriched uranium with low enriched uranium or natural uranium to decrease the overall enrichment level of the uranium in order to make it less attractive from a proliferation perspective, i.e. not as readily usable in a weapon.

Fissile—Capable of being split by a low-energy neutron. The most common fissile isotopes are uranium-235 and plutonium-239.

HEU—Highly enriched uranium. Uranium that is enriched in the uranium-235 isotope to greater than 20 percent. For weapons, generally 90 percent enrichment is used. (Natural uranium, which cannot be used for weapons, contains only 0.7 percent uranium-235 and 99.3 percent uranium-238.)

IAEA—International Atomic Energy Agency.

LEU—Low enriched uranium. Uranium that is enriched in the uranium-235 isotope to less than 20 percent. It is used as nuclear reactor fuel, which is generally manufactured at below five percent uranium-235.

MCC—Material consolidation and conversion.

MinAtom—Russian Ministry of Atomic Energy.

MPC&A—Material protection, control, and accounting.

NGO—Non-Governmental Organization.

NIS—New Independent States (formerly part of the Soviet Union).

NN—Office of Defense Nuclear Nonproliferation.

NN-50—Office of International Material Protection and Emergency Cooperation.

NNSA—National Nuclear Security Administration.

Nonproliferation Activities—Activities to reduce the threat of proliferation of weapons of mass destruction to WMD

Pu—Plutonium. A heavy, radioactive, metallic element with the atomic number 94.

Rapid MPC&A Upgrades—Upgrades that are done initially to provide a rapid increase in security of the nuclear material and may include placing bricks in front of windows and installing hardened doors, delay blocks and steel cages, access control, and basic accounting elements.

Weapons-grade—Nuclear material of the type most suitable for nuclear weapons, i.e., uranium enriched to 90 percent or more of uranium-235 or plutonium that is primarily plutonium 239.

Weapons-usable nuclear material—Highly-enriched uranium (HEU-uranium that has been enriched above 20% in the 235U isotope) and/or plutonium (Pu) that has been reprocessed from irradiated nuclear fuel.

WMD—Weapons of mass destruction (nuclear, chemical, or biological).

STRATEGIC PLANNING TERMS

Customers—The people or groups that the organization exists to serve.

Goals—The first level of specificity in the strategic planning process that identifies how the Vision will be realized. Goals are longer term in nature, and are broad statements describing a desired future condition or achievement.

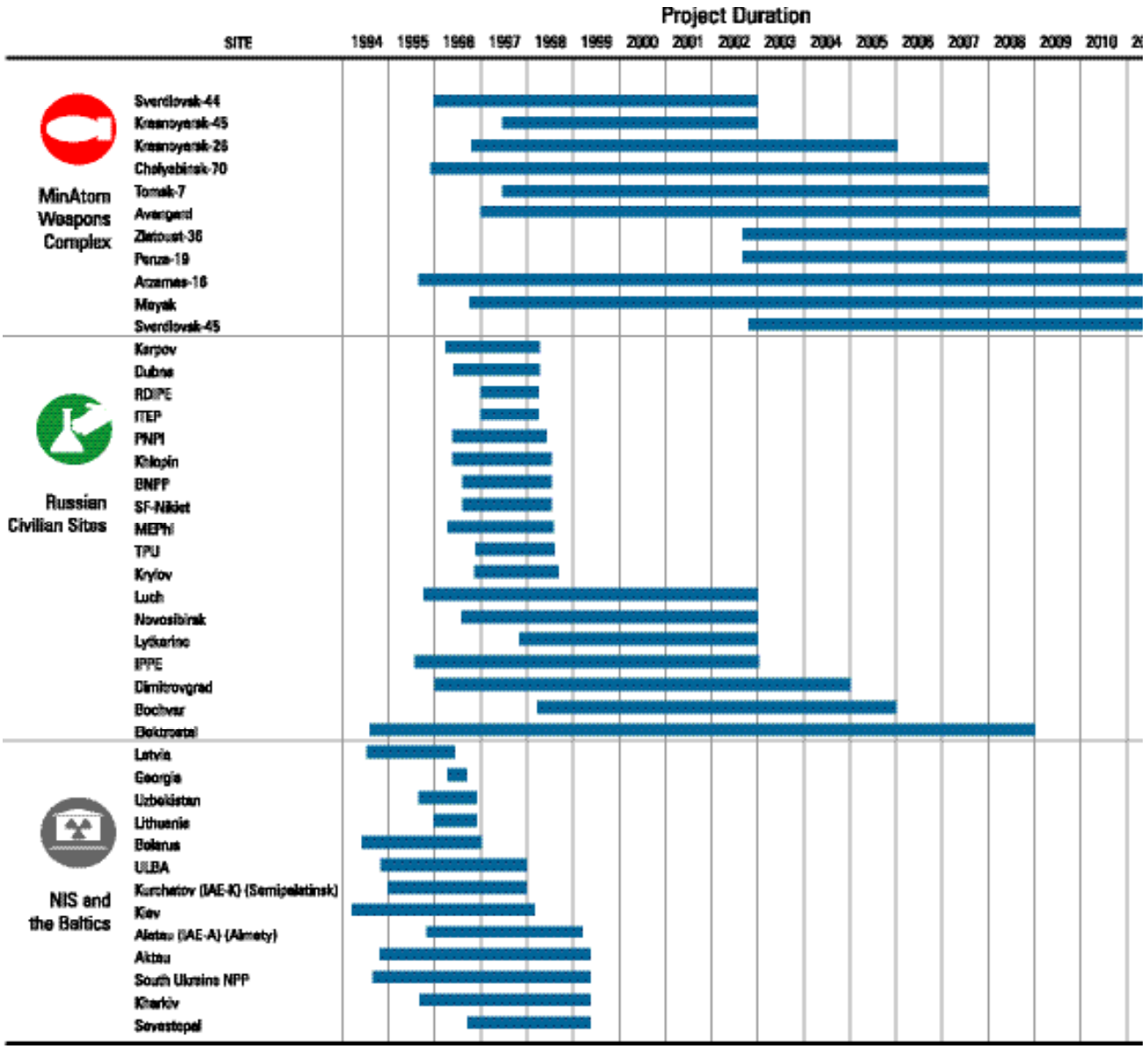
Mission—Captures the enduring nature of what the organization is about—the organization's grand purpose; why it exists and what need it fulfills.

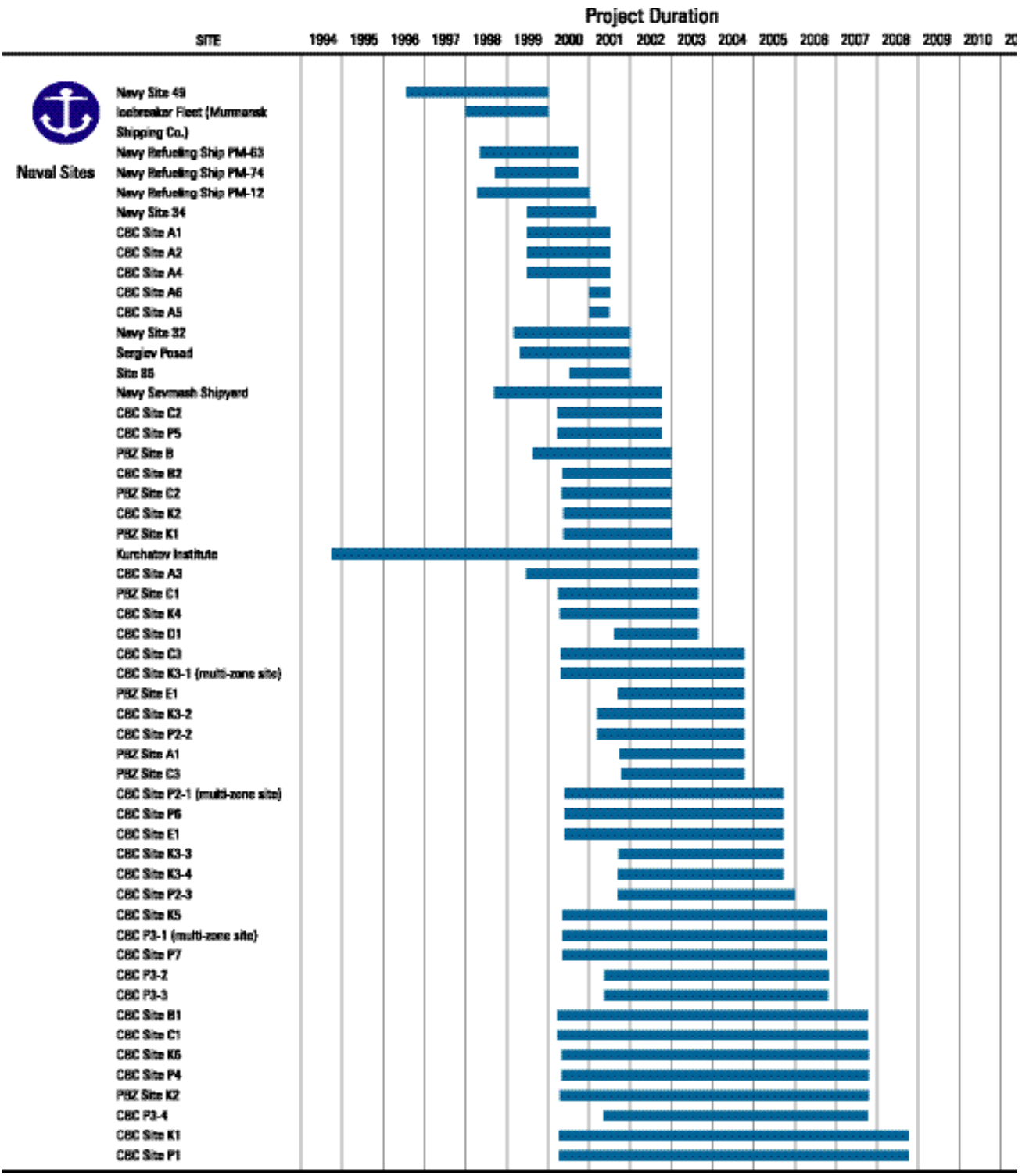
Objectives—Provide additional specificity about how goals will be accomplished. Objectives are more near term and measurable, and clearly describe an intended outcome.

Stakeholders—Are the people or groups that have a vested interest in or contribute to the successful future of the organization.

Vision—Captures the desired end state of the organization and describes its future direction. It provides unity of direction and long-term focus.

Appendix B
Project Plan




Project Duration
SITE
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Naval Sites
Navy Site 49
Icebreaker Fleet (Murmansk Shipping Co.)
Navy Refueling Ship PM-63
Navy Refueling Ship PM-74
Navy Refueling Ship PM-12
Navy Site 34
CBC Site A1
CBC Site A2
CBC Site A4
CBC Site A6
CBC Site A5
Navy Site 32
Sergiev Posad
Site 86
Navy Sevmash Shipyard
CBC Site C2
CBC Site P5
PBZ Site B
CBC Site B2
PBZ Site C2
CBC Site K2
PBZ Site K1
Kurchatov Institute
CBC Site A3
PBZ Site C1
CBC Site K4
CBC Site D1
CBC Site C3
CBC Site K3-1 (multi-zone site)
PBZ Site E1
CBC Site K3-2
CBC Site P2-2
PBZ Site A1
PBZ Site C3
CBC Site P2-1 (multi-zone site)
CBC Site P6
CBC Site E1
CBC Site K3-3
CBC Site K3-4
CBC Site P2-3
CBC Site K5
CBC P3-1 (multi-zone site)
CBC Site P7
CBC P3-2
CBC P3-3
CBC Site B1
CBC Site C1
CBC Site K6
CBC Site P4
PBZ Site K2
CBC P3-4
CBC Site K1
CBC Site P1

Through FY01, the MPC&A Program has completed comprehensive upgrades at 38 sites.

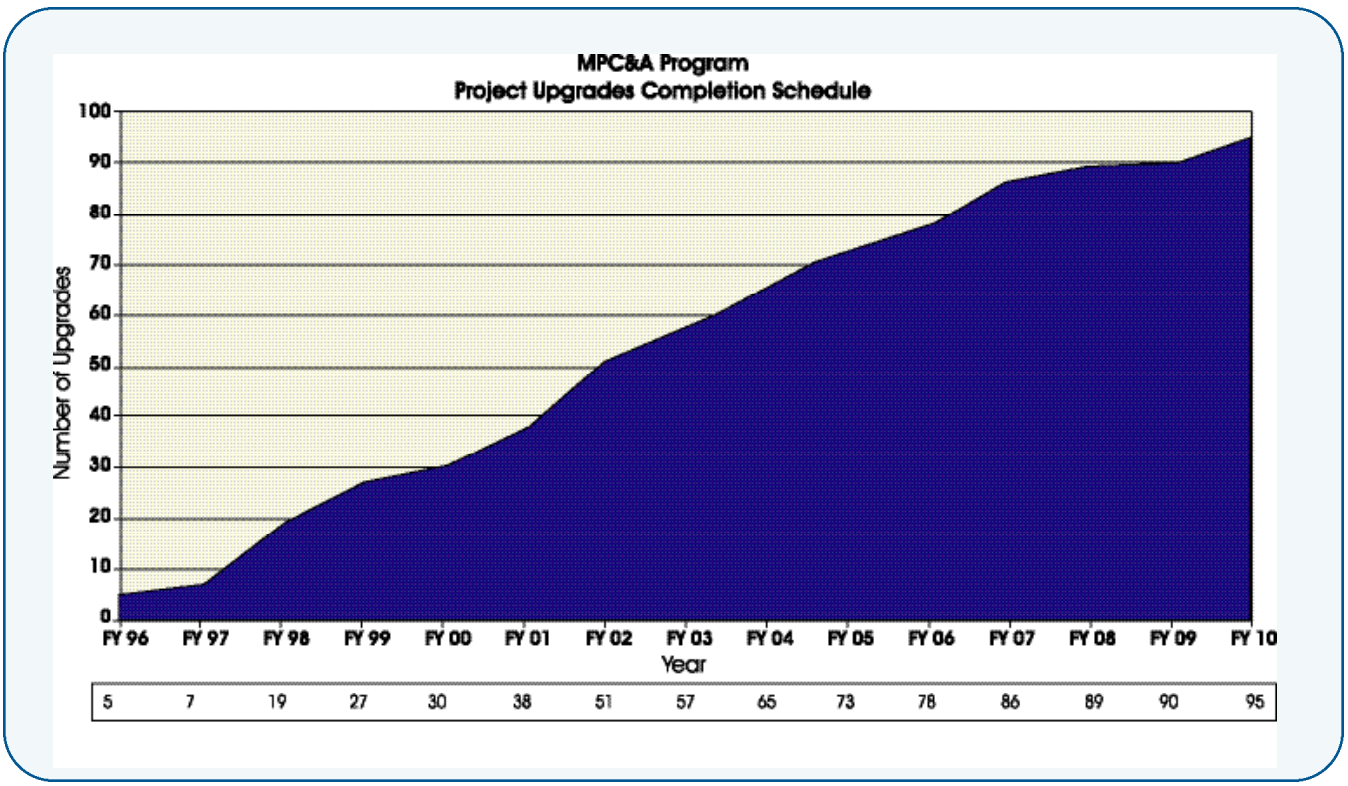
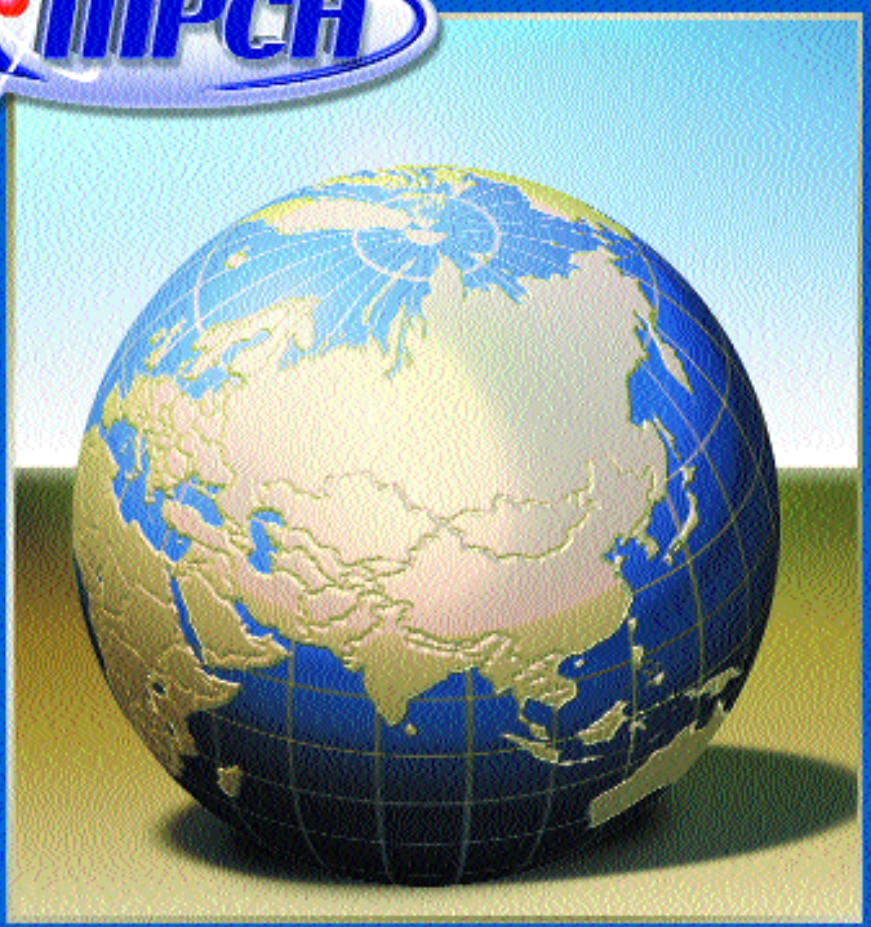


Figure 12. Cumulative Project Upgrades Completion Schedule


MPCA



For more information, please see the
MPC&A Program website at:

http://www.nn.doe.gov/mpca/index.html