



Protecting Our Nation

Since 9-11-01

A Report of the U.S. Nuclear Regulatory Commission



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Executive Summary

Nuclear security under the oversight of the NRC is a product of the private sector working in close partnership with Federal, State, and local authorities. Well before the terrorist attacks on September 11, 2001, the NRC had provided for the protection of these key parts of our national infrastructure and public safety. This report outlines additional NRC actions to protect our Nation's nuclear facilities against terrorist attacks. These actions include significant reinforcement of the defense capabilities for nuclear facilities, better control of sensitive information, and enhancements in emergency preparedness to further strengthen NRC's nuclear facility security programs.

Security is a priority for the NRC

For decades, nuclear power plants were well protected by physical barriers, armed guards, intrusion detection systems, area surveillance systems, access controls, and access authorization requirements for employees working inside the plants. In response to the September 11 attacks, NRC moved aggressively to further enhance safety and security, and has comprehensively re-evaluated and strengthened security at nuclear power plants and other facilities, and for radioactive material it regulates. Nuclear power plants continue to likely be the best protected private sector facilities in the Nation.

NRC has strengthened requirements and enhanced coordination

NRC major actions since September 11, 2001 include:

- I. Ordered plant owners to increase physical security to defend against a more challenging adversarial threat;
- II. Required strict site access controls for personnel;
- III. Required utilities to conduct vehicle checks at greater stand-off distances;
- IV. Improved liaison with Federal, State, and local agencies responsible for protection of the national critical infrastructure through integrated response planning;

- V. Enhanced communication and liaison with the Intelligence Community;
- VI. Improved communication between military surveillance authorities, NRC, and its licensees to prepare power plants and to effect safe shutdown should it be necessary;
- VII. Ordered plant owners to improve their capability to respond to events involving explosions or fires;
- VIII. Enhanced readiness of security organizations by strengthening training and qualification programs for plant security forces;
- IX. Enhanced force-on-force exercises to provide a more realistic test of plant capabilities to defend against an adversary force; and
- X. Worked with national experts to predict the realistic consequences of terrorist attacks on nuclear facilities, including one from a large commercial aircraft. For the facilities analyzed, the results confirm that the likelihood of both damaging the reactor core and releasing radioactivity that could affect public health and safety is low. Even in the unlikely event of a radiological release, due to a terrorist use of a large aircraft against a nuclear power plant, the studies indicate that there would be time to implement the required on-site mitigating actions. These results have also validated the off-site emergency planning basis.

The NRC has enhanced emergency preparedness and response capabilities to address the threat of terrorist attack

The terrorist attacks on September 11, 2001, reemphasized that emergency preparedness is a crucial element in protecting our Nation's critical infrastructure. Accordingly, NRC licensees have made substantial improvements in their emergency plans and their preparedness of responders to deal with the challenges of a terrorist attack. Nuclear power plants are required to have emergency plans that are tested on a routine basis through exercises and drills. First responders from Federal, State, and local government agencies and plant staff participate in these exercises.

The NRC has increased the security of radioactive materials

The NRC has long-standing regulatory programs to ensure the security of NRC-licensed radioactive material, particularly material that could be used in an improvised nuclear device or a radiological dispersal device. Since September 11, 2001, the NRC has required security improvements for high-risk sources and is enhancing the tracking of these sources. Moreover, the NRC is increasing controls on export and import of high-risk sources.

The NRC has reorganized to better manage nuclear security and response

The NRC has made a number of changes in its organizational structure, facilities, personnel, and procedures to improve oversight of security and emergency preparedness of nuclear facilities. The NRC has accomplished these changes and the enhancements to security and emergency response using existing authority. The agency continues to propose several legislative initiatives designed to increase response capabilities of licensees' security organizations.



Introduction

The U.S. Nuclear Regulatory Commission (NRC) is committed to protecting the health and safety of the public and the environment. The terrorist attacks on September 11, 2001, reaffirmed the need for collective vigilance, the need for enhanced security, and improved emergency preparedness and incident response capabilities across the Nation's critical infrastructure. As a result, the NRC has since conducted a comprehensive review of the agency's security programs and made further enhancements to security at a wide range of NRC-regulated facilities.

Nuclear security, achieved through effective regulation of the industry, and strong partnership with a variety of Federal, State, and local authorities, had been in place for decades before the terrorist attacks occurred. Then and now, nuclear power plants likely represent the best protected private sector facilities in the U.S.

This report describes a carefully planned, progressive approach to strengthening the NRC's security program to protect our Nation's nuclear facilities and materials against terrorist attack. This progressive approach begins with voluntary measures, then proceeds through mandatory Orders, and finally reaches fruition through a directed ability to respond to an even greater threat. In implementing this approach, the NRC has already undertaken a comprehensive sequence of enhancements to bolster the security of our Nation's nuclear facilities and radioactive materials. This report captures the highlights of these actions, but is not intended to be an all-inclusive account of the NRC's efforts in this area.

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Enhancements to Nuclear Security

Background

Since Congress established the NRC in 1975, the agency has recognized the importance of security at the Nation's sensitive nuclear facilities, including nuclear power plants and other key nuclear facilities. Following September 11, 2001, the NRC immediately placed nuclear power plants and other facilities at the highest level of alert using procedures developed years before the attacks. From NRC's Operations Center in Rockville, Maryland, the NRC Chairman and senior staff on an Executive Team coordinated NRC's actions with Federal and State authorities and NRC licensees.

The Nation's nuclear power plants had implemented strong physical protection programs decades before September 11, 2001. The plants were already surrounded by fences with continuously monitored perimeter detection and surveillance systems, and they were guarded by well-trained and well-armed security forces. The plants also have redundant and diverse safety equipment so that if any active component becomes unavailable, another component or system will satisfy its function. In addition, plant operators had been trained to respond to unusual events and emergencies, and each plant has carefully designed emergency plans in place.

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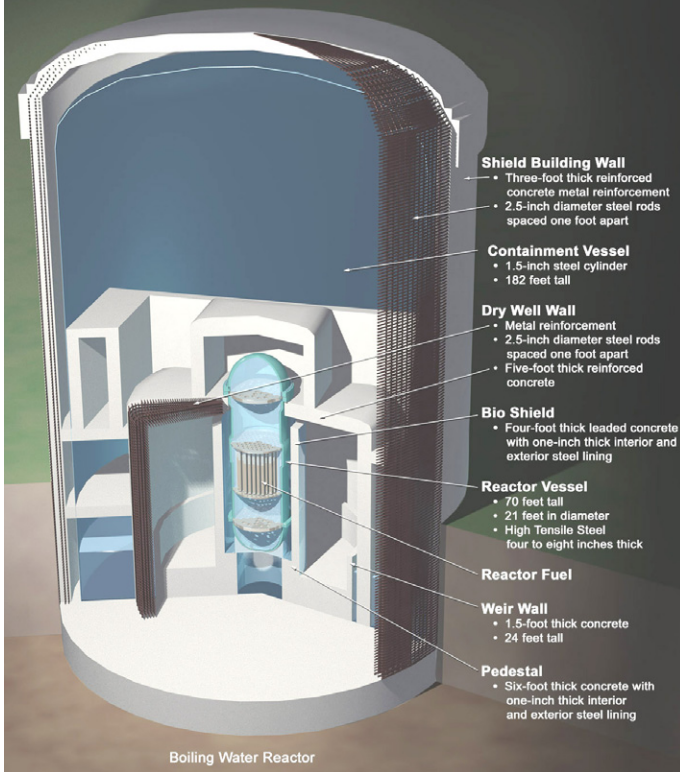
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Multiple Layers of Safety at Nuclear Power Plants



Current Program and a Look Forward

A result of NRC's past and present security program is the successful protection of nuclear facilities. Although this program has been effective in deterring a terrorist event to date, actions taken since September 11, 2001 both diminish the probability of such an attack occurring at nuclear facilities and enhance our response capabilities if one were to occur.

Following the terrorist attacks on September 11, 2001, the NRC conducted a thorough review of security to continue to ensure that nuclear power plants and other licensed facilities had robust security measures in place. In so doing, the NRC recognized that some time would be necessary to conduct a thorough review including threat and vulnerability assessments, so the agency advised and required licensees to make prompt, interim enhancements to security. These interim enhancements increased security at nuclear power plants and other facilities with respect to physical barriers, access controls, armed response capabilities, and emergency preparedness. Since that time, the NRC has begun replacing those interim

enhancements with more stable and predictable requirements, which are updated based on a periodic assessment of the current threat environment, technology, and studies.

Orders to Enhance Security

Power Reactors - February 2002

The NRC required power reactor licensees to enhance security and improve their capabilities to respond to a terrorist attack. These enhancements to security included increased security patrols, augmented security forces, additional security posts, increased vehicle standoff distances, and improved coordination with law enforcement and intelligence communities, as well as strengthened safety-related mitigation procedures and strategies. The NRC subsequently inspected each facility to verify the licensee's implementation, evaluated the inspection findings, and when necessary, required action to address any noted deficiencies.

Access Authorization - January 2003

The NRC required licensees to enhance background investigations of persons applying for and holding unescorted access to power reactor facilities. The NRC also required additional oversight of employees holding or requesting unescorted access at these facilities or who have access to sensitive security information called "Safeguards Information." In addition, the NRC coordinated with other Federal agencies to enhance the background investigation process.

Access Control Terminal



Supplemental Requirements Related to the Design Basis Threat - April 2003

After soliciting and receiving comments from appropriate Federal, State, and industry stakeholders, the NRC issued new requirements supplementing the Design Basis Threats (DBTs) that provided additional details regarding specific adversary characteristics against which power reactors and Category I fuel cycle facilities (facilities that process nuclear weapons-grade uranium), need to protect. While the specifics of these changes are sensitive, in general these supplements to the existing threat result in enhancements such as increased patrols, augmented security forces and capabilities, additional security posts, additional physical barriers, vehicle checks at greater standoff distances, enhanced coordination with law enforcement and military authorities, augmented security and emergency response training, equipment, and communication, and more restrictive site access controls for personnel, including expanded, expedited, and more thorough employee background checks.

The NRC's DBTs address more than terrorist attacks. They include radiological sabotage and theft or diversion of NRC-licensed material. Specifically, the DBTs represent the largest threat against which private sector facilities must be able to defend with high assurance. This capability is tested in Force-on-Force (FOF) exercises described later in this report. Nuclear utilities were required to reassess their security and contingency plans in view of these supplemental requirements associated with the DBT. The NRC is currently reviewing the nearly 200 revised security plans submitted by licensees to address the new requirements, and expects that all plans will be reviewed and approved, and nearly all plans implemented by October 29, 2004.

Fitness-For-Duty/Fatigue - April 2003

The increased emphasis on security in the current threat environment initially translated into longer working hours for security force personnel. As a result, concerns arose as to whether these longer working hours adversely affected the performance of security personnel. In response to those concerns, the NRC required nuclear power plant licensees to impose enforceable work-hour limits on security force personnel and procedures to evaluate security force fatigue. These enhancements have been in place since October 2003.

Training and Qualifications for Security Force Personnel - April 2003

The NRC issued Orders requiring nuclear power plant licensees to enhance training and qualification programs to ensure that armed security personnel are fit, properly trained, and qualified. The Orders require enhancements that include fitness requirements, as well as drills and exercises that will encompass defensive strategies and capabilities for the DBT and the supplemental requirements. These enhancements are planned for implementation by October 29, 2004.

Radiation Source Security Programs - 2001 - 2004

Prior to the terrorist attacks on September 11, 2001, the NRC had modest requirements for materials licensees related to security of radioactive sources. Those requirements were established as part of radiation safety programs. Soon after the terrorist attacks, however, the NRC identified the need to enhance security measures to protect against theft or sabotage of the higher-risk sources used by industrial, medical, and research licensees. In particular, in 2002-2003, the NRC and the U.S. Department of Energy worked together to identify the highest risk radioactive sources that could be used to make radiological exposure devices (REDs) and radiological dispersal devices (RDDs) or “dirty bombs.” Based on this work, the NRC and the States are working together in identifying and ensuring the implementation of necessary additional security measures. The NRC imposes additional temporary measures, if needed, to ensure elevated security during periods of heightened threat levels or events of national significance. When addressing such events, the NRC coordinates with other Federal agencies.

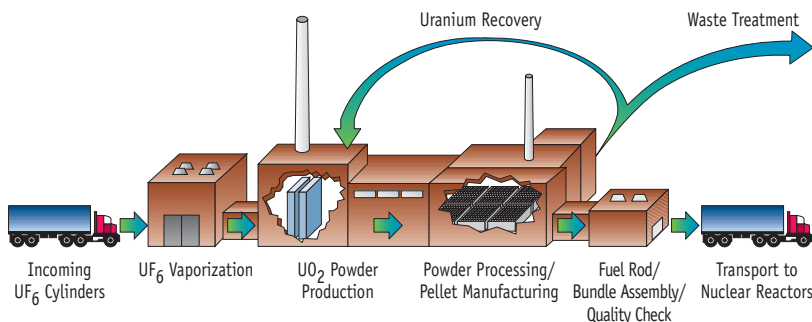
The NRC also imposed security enhancements on panoramic irradiator licensees in June 2003, and imposed security enhancements on manufacturers and distributors of high-risk sources in January 2004. Panoramic irradiators are primarily used for sterilizing and disinfecting medical, food, and industrial products. Manufacturers and distributors make the sealed sources from bulk radioactive material and transfer them to licensees for medical and industrial applications.

The NRC will continue to review our programs to ensure that the security requirements imposed on the Nation’s nuclear power plants and other agency-licensed nuclear facilities, as well as those related to radioactive sources, protect the public health and safety, common defense and security, and the environment.

Other Facilities - 2002-2004

The NRC also imposed enhanced security requirements on other nuclear and radioactive material facilities. These included Category I fuel cycle facilities, gaseous diffusion plants (GDPs), a uranium conversion facility, facilities that process low enriched uranium (commonly known as Category III fuel cycle facilities), decommissioning reactors, independent spent fuel storage installations (ISFSIs), high-risk radioactive sources, spent fuel transportation, and research and test reactors.

Typical Fuel Fabrication Process





Threat Assessment

Background

The NRC has systematically assessed threats to licensed nuclear facilities and activities since the 1970s to provide indications and warnings of potential attacks or other malevolent activities. To communicate threat information rapidly to licensees and response agencies, the NRC developed the Threat Advisory System, which has been in use since the mid-1980s. Advisories are non-public, rapid communications from the NRC to our licensees that provide information obtained from the Intelligence Community or law enforcement agencies on changes to the threat environment. Advisories also include guidance for licensees to promptly take specific actions to strengthen their capabilities to defend against the threat.

Although advisories are not legally binding, they are effective in quickly conveying important information to large numbers of licensees. They are tailored to categories of licensees including power reactors, non-power reactors, fuel facilities, decommissioning reactors, independent spent fuel storage installations, gaseous diffusion plants, and materials licensees.

The NRC expanded the Threat Advisory System after the September 11 terrorist attacks to include a broader range of licensees. In addition, the NRC has incorporated the threat condition levels used in the Homeland Security Advisory System (HSAS), administered by the U.S. Department of Homeland Security (DHS) into the NRC's Threat Advisory System. The NRC threat assessment staff

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reviews, analyzes, coordinates, and disseminates threat and intelligence information, at both strategic and tactical levels, with respect to the U.S. civilian nuclear sector. Threat assessment staff also serves as the NRC's liaison and coordination staff with other organizations and agencies, such as those within the intelligence and law enforcement communities.

Current Program and a Look Forward

Following the terrorist attacks on September 11, 2001, the NRC conducted a comprehensive review of the domestic and international threat environment and worked with intelligence and law enforcement agencies to provide the analytical basis for supplemental requirements associated with the DBT, which the agency issued in April 2003. The NRC staff continues to assess the threat environment and coordinate with the intelligence and law enforcement agencies, including DHS. The staff formally reports to the Commission semi-annually concerning the threat environment and reviews and recommends, for Commission consideration, potential changes to the DBTs.

The NRC staff also performed a systematic review of existing safeguards and security programs, including the DBTs. The Commission's initial consideration of the enhanced threat characteristics was reflected in specific enhancements to security required in the interim compensatory measures for power reactors in February 2002 and Category I fuel facilities in August 2002. Subsequently, the staff provided the Commission with two comprehensive assessments of the threat environment and possible adversary attributes for consideration based on review of relevant intelligence and law enforcement information, as well as interagency discussion. During this time, the staff also participated in the working group that developed the U.S. Departments of Energy and Defense (DOE and DoD, respectively) Postulated Threat. Although not intended to apply to the commercial nuclear sector, the Postulated Threat provided analytical insights to be considered for application to NRC licensed facilities. The staff also coordinated with the DOE to ensure clear understanding of each agency's DBTs and security measures for comparable activities.

The NRC held several meetings regarding supplementary requirements related to the DBT with authorized stakeholders including Federal and State authorities and industry representatives. In April 2003, the NRC issued Orders providing the supplemental requirements related to the DBTs to the power reactors and the Category I Fuel facilities. The NRC then reinstated the semi-annual reviews of the DBTs to ensure their continuing validity.

In addition, threat assessment is a key function of NRC's Information Assessment Team (IAT), which is staffed by threat and security specialists at the agency's headquarters and regional offices. The IAT serves as the agency focal point for initial threat and security incident assessment within the NRC. Through the IAT, the NRC ensures that licensees and Federal, State, and local authorities promptly

receive and respond to threat and security information. For example, as a result of security incidents and changes in the threat levels established through the HSAS, the NRC has issued numerous Advisories to licensees informing them of changes in the threat environment since September 11, 2001.

In addition to the enhanced information exchange with law enforcement and intelligence agencies, the NRC has increased its ability to communicate that information to those who need to know through a program of granting clearances to a limited number of industry personnel, as well as an increase in secure communications equipment for the NRC. This program, along with increased coordination with other agencies, has given the NRC the ability to communicate classified threat information in real time to agency licensees if the need should arise.

The threat assessment staff exchanges terrorism and threat information with law enforcement and intelligence communities including the DHS, the Transportation Security Administration (TSA), the Federal Bureau of Investigation (FBI), the Central Intelligence Agency (CIA), and others. The NRC will continue to review intelligence and threat reporting to recommend any appropriate modifications to the DBTs. In addition, the NRC works closely with other Federal agencies and the Intelligence Community to ensure that the current threat environment and adversary characteristics are reflected in required security measures to protect the public.



Force-on-Force Exercises

Background

The NRC initiated the Force-on-Force (FOF) exercise program in the early 1980s as a means to confirm the adequacy of licensee security programs in response to NRC regulatory requirements. The purpose is to evaluate the effectiveness of the licensees' security plans against a series of attack scenarios by a simulated commando-style mock adversary force seeking to exploit potential deficiencies in the plant's defensive strategy. The adversary force attempts to reach and destroy enough safety equipment to set in motion an accident that would damage the reactor's core or spent fuel pool and potentially cause a release of radiation to the environment. The nuclear power plant's security force, in turn, seeks to interdict the adversary force and prevent them from reaching the safety equipment.

Prior to the terrorist attacks on September 11, 2001, the NRC conducted a FOF exercise at each reactor site approximately once every eight years. In the wake of the terrorist attacks, however, the Commission temporarily suspended the FOF evaluations at nuclear power plants and Category I fuel cycle facilities.

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The Commission's primary concern was that conducting such exercises would have significantly distracted the licensees' security forces and the NRC staff during a time when licensees needed to focus on implementing the NRC's highest level of alert, as well as numerous security upgrades. The Commission subsequently resumed the FOF exercise program in February 2003.

Current Program and a Look Forward

Since September 11, 2001, the NRC has issued supplemental requirements related to the DBT, which required licensees to enhance security. As a result, the agency has expanded its FOF program to reflect these changes and make the exercises more realistic, while ensuring the safety of both plant employees and the public. These changes have significantly increased the level of complexity for each exercise in terms of planning, preparation, and logistical

support. In February 2003, the NRC initiated pilot FOF exercises that included additional participants and weaponry, more complex tactical approaches and defensive strategies, increased attention on the adversaries approach to the plant perimeter, and state-of-the-art exercise equipment. These enhancements have increased the realism associated with FOF exercises.

In 2003, the NRC conducted expanded FOF pilot exercises at 15 commercial nuclear power reactors with a variety of designs, locations, and size characteristics. This increased frequency of FOF exercises reflects the Commission's decision to conduct such exercises in the future at least once every three years at each site. The staff has also revised the exercise program to incorporate lessons learned and is now in transition to fully implement the expanded program in November 2004. The staff is conducting the transitional FOF exercise program at a pace of approximately two exercises per month, which will enable the staff to complete an additional 16 exercises by October 29, 2004. Ultimately, the revised program will test the licensee's response and evaluate the conduct and control of the exercises, equipment, and the adversary force.

As one of the ongoing enhancements to improve the realism of FOF exercises, the NRC is incorporating Multiple Integrated Laser Engagement System (MILES) equipment into the exercises. When used properly and with sufficient training, MILES equipment (mock weaponry) provides a much greater degree of realism and reduces many artificialities of simulated combat. NRC also revised its guidance by requiring that licensee-provided MILES equipment meet appropriate use standards. The use of MILES during the expanded FOF pilot successfully contributed to pilot program results.

A credible, well-trained, and consistent mock adversary force is vital to the overall success of the NRC's FOF exercise program. To date, licensees have assembled adversary teams from a variety of sources including security officers from their own sites, other licensees, and State police tactical team members. However, these diverse sources gave rise to inconsistencies in the adversary team capabilities, training, and knowledge. In response, NRC interacted with the industry to develop a composite adversary force, which would be trained to standards issued by the Commission. The adversary force for all FOF exercises conducted after October 2004 will be drawn from this composite force.



Power Reactor Security Baseline Inspection Program

Background

Prior to the attacks on September 11, 2001, the NRC conducted a Baseline Inspection Program for power reactors as part of the agency's Reactor Oversight Program. Through a sampling of licensees' security activities, the NRC assessed whether each licensee's security program complied with requirements and provided adequate protection against the DBT for radiological sabotage. The security oversight program focused on four key areas, which are: (1) access authorization, (2) access control, (3) response to contingency events, and (4) security plan changes. The NRC also conducted similar oversight programs for other significant nuclear facilities that had security programs, including Category I fuel cycle facilities and reactors undergoing decommissioning.

Current Program and a Look Forward

Following the terrorist attacks on September 11, 2001, the NRC enhanced both security requirements and the level of security oversight. The NRC also revised

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the Baseline Inspection Program for nuclear power reactors and is making comparable changes to oversight programs for other nuclear facilities. The NRC has confirmed effective implementation of the interim security enhancements at nuclear power plants and has begun the revised Baseline Security Inspection Program.

Security inspection oversight has increased significantly since the terrorist attacks on September 11, 2001. In 2000, approximately 40 staff weeks of direct inspection effort were spent on security inspections (excluding FOF exercises) for nuclear power reactors. By 2003, this inspection effort had increased to 205 staff weeks - more than five times the effort expended annually before the terrorist attacks. The NRC also implemented a Management Review Panel to ensure that inspection findings and potential violations are treated in a consistent and appropriate manner, which is especially important during this transition period. As a result, NRC's inspection program remains an essential element for ensuring that the licensees have made the necessary enhancements to their security programs and are responsive to changes in threat levels.

Drawing on insights gained during the inspections conducted from 2001 to 2003, the NRC revised and implemented the baseline inspection program in February 2004. The new program includes: Access Authorization; Access Controls; Security Plan Changes; Contingency Response - FOF Testing (conducted by licensees as part of the enhanced training program ordered by NRC); Equipment Performance, Testing and Maintenance; Protective Strategy and Evaluation, Security Training, the Fitness for Duty Program; Owner Controlled Area Controls; Information Technology Security; Material Control and Accountability; and Physical Protection of Shipments of spent nuclear fuel. The inspection oversight program will continue to evolve as a result of ongoing studies and experience with the program.



Vulnerability Assessments and Mitigation Strategies

Background

A Vulnerability Assessment (VA) is a systematic evaluation in which qualitative and quantitative techniques are applied to determine potential vulnerabilities to radiological sabotage, theft or diversion of radioactive material. As such, VAs can be used to identify effective countermeasures or mitigating measures to protect specific targets. The NRC is also using the VA's results to confirm the effectiveness of the mitigative strategies that the Commission ordered in February 2002 for nuclear power plants. In addition, the assessments are used to develop additional mitigating measures for licensees to implement and to assist national efforts to enhance infrastructure protection. NRC's efforts related to radioactive

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materials, transportation, and storage in spent fuel casks are described in the other sections of this report.

From a structural point of view, nuclear power plants are designed to protect against such external events as tornados, hurricanes, fires, and floods. By the same token, these same structural features, supported by the deployment of effective and visible physical protection measures, are powerful deterrents to any terrorist activities. Additionally, the emergency procedures and severe accident management strategies developed for reactor accidents also provide means for mitigating the potential consequences of terrorist attacks should they occur.

The NRC conducted vulnerability assessments for some operating nuclear power plants and spent fuel pools in the 1970s and 1980s to establish the technical basis for security requirements. The staff also routinely evaluated the potential impacts of terrorist attacks on power reactors as part of the FOF exercise program on a plant-by-plant basis. In addition, as a result of increasing concerns about the threat and vulnerability of nuclear facilities to the threat of computer attacks, the NRC initiated some cybersecurity assessments in the late 1990s. At that time there was no consideration given to conducting VAs of an intentional aircraft attack at a nuclear power plant, although some evaluations of accidental crashes were completed during the licensing of nuclear power plants located relatively close to airports. The risk of accidental aircraft crashes into spent fuel pool structures has been similarly evaluated.

Current Program and a Look Forward

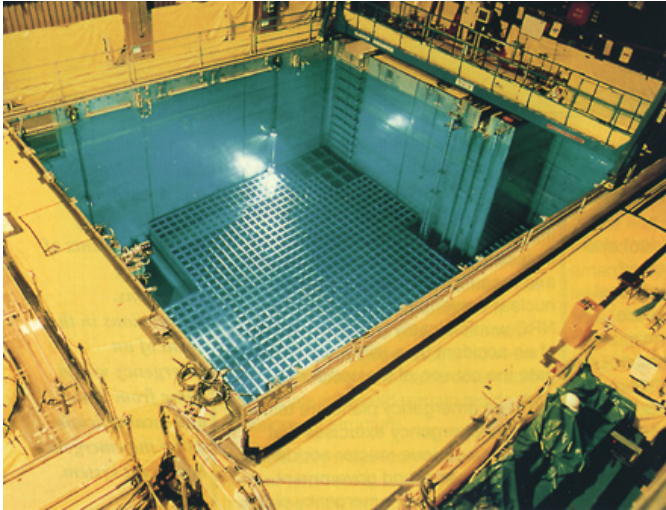
After the terrorist attacks on September 11, 2001, the NRC promptly assessed the potential for and consequences of terrorists targeting a nuclear power plant for aircraft attack, the physical effects of such a strike, and compounding factors such as meteorology that would affect the impact of potential radioactive releases. As a result of these preliminary assessments, the NRC required that nuclear power plant licensees implement interim enhancements to mitigate potential consequences in the unlikely event of a successful attack on a nuclear power plant.

As part of a comprehensive review of security for NRC-licensed facilities, the NRC conducted detailed site-specific engineering studies of a limited number of nuclear power plants to assess potential vulnerabilities of deliberate attacks involving large commercial aircraft. In conducting these studies, the NRC drew on national experts from several DOE laboratories using state-of-the-art structural and fire analyses. The agency also enhanced its ability to predict accident progression and radiological consequences realistically. For the facilities analyzed, the vulnerability studies confirm that the likelihood of both damaging the reactor core and releasing radioactivity that could affect public health and safety is low. Even in the unlikely event of a radiological release due to terrorist use of a large aircraft,

there would be time to implement mitigating actions and offsite emergency plans such that the NRC's emergency planning basis remains valid. Additional site-specific studies of operating nuclear power plants are underway or being planned to determine the need, if any, for additional mitigating capability on a site-specific basis.

The NRC has also collaborated closely with the U.S. Coast Guard (USCG) with respect to the Maritime Transportation Security Act and associated waterborne VAs. The NRC's continuing interaction with the USCG includes developing Area Maritime Security Plans, participation in the USCG Underwater Assault Working Group, and developing an agreement with the USCG in this area. Further, the NRC will continue interacting with DHS with respect to additional barriers against waterborne threats for nuclear power plants and analyses of critical infrastructure protection. The NRC is also extensively involved in industry and government interagency working groups to identify technologies that may prove beneficial for securing the Nation's critical infrastructure.

Further NRC VA efforts will be directed to confirm and extrapolate results as needed. Additional studies will focus on power reactor facilities and spent fuel pools to further develop mitigation measures at specific sites. Land-based assault VA methodologies are also planned for use by the NRC and licensee security staff to design more sophisticated physical protection systems than are in place today.



Spent Fuel Storage

Background

Prior to 1976, national policy called for reprocessing spent nuclear fuel after a short cooling period. Therefore, the Nation's nuclear power plants were only designed to hold a limited amount of spent nuclear fuel within each spent fuel pool (wet storage). As a result of changes in the national non-proliferation policy in the 1970s, the industry suspended reprocessing in favor of storing spent fuel at the power reactor sites and ultimately disposing of the fuel in a geological repository. However, delays in the development of the repository led to greater amounts of spent fuel requiring onsite storage.

Consequently, the industry made modifications to increase the capacity of the spent fuel pools ("reracking"). In addition, beginning in the early 1980s, the nuclear power industry requested NRC approval to store spent fuel onsite in dry storage. One solution was to use dry storage casks in an independent spent fuel storage installation (ISFSI). The casks themselves are very robust massive concrete and/or steel structures. The NRC has required the ISFSIs to have security systems to protect against unauthorized access to the spent fuel. In addition, the NRC conducted several classified studies evaluating the robustness of spent fuel storage casks to bulk explosives and shaped charges to evaluate their potential vulnerability to ground assaults.

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Current Program and a Look Forward

Consistent with the approach taken at other categories of nuclear facilities, the NRC responded to the terrorist attacks on September 11, 2001, by promptly developing and requiring security enhancements for both spent fuel storage in spent fuel pools and dry casks. The NRC also worked with the industry to develop guidance to ensure that the security enhancements provided adequate protection in the current threat environment until NRC completed more systematic assessments of potential vulnerabilities and mitigating measures.

In parallel with these efforts, the NRC initiated vulnerability assessments for spent fuel storage in casks at ISFSIs. The assessments specifically evaluate two different threat scenarios: a large aircraft impact similar in magnitude to the attacks on September 11, 2001, and ground assaults using expanded adversary characteristics consistent with the DBT for radiological sabotage. Because several cask designs are currently in use, the assessment has been conducted for several casks.

The staff chose four storage cask designs currently licensed by the NRC to evaluate their strength when struck by a large aircraft. These evaluations include structural analyses of the aircraft impact into a single cask and the resulting cask-to-cask interactions. Thermal evaluations were performed to estimate the effect of the jet fuel fire on the casks. Those evaluations indicate that it is highly unlikely that a significant release of radioactivity would occur from an aircraft impact on a dry spent fuel storage cask.



Spent Fuel Transportation

Background

Of the more than 290 million shipments of hazardous material in the U.S. each year, approximately 3 million shipments involve radioactive material. Of these 3 million shipments, fewer than 50 involve shipments of spent nuclear fuel. These shipments typically move by road, rail, or water, because of the heavier weight of these packages. Packages used to ship commercial spent nuclear fuel are robust structures that typically weigh 125 tons or more. For decades, the NRC has required that such packages must withstand different types of accidents, including dropping, puncturing, flooding, and fire, to ensure protection of the public health and safety. The associated security measures for spent nuclear fuel transportation complement the safety controls. The NRC requires that licensees and carriers involved in these shipments follow only approved routes, provide armed escorts, immobilization devices, redundant communications, and advance notifications of shipments to the NRC and States through which the

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shipments pass. The NRC established these measures using a graded approach which reflected the differing risks posed by the various material being shipped, and were based on an earlier study evaluating the potential vulnerability of radioactive material transportation packages to various terrorist weapons and explosives.

Current Program and a Look Forward

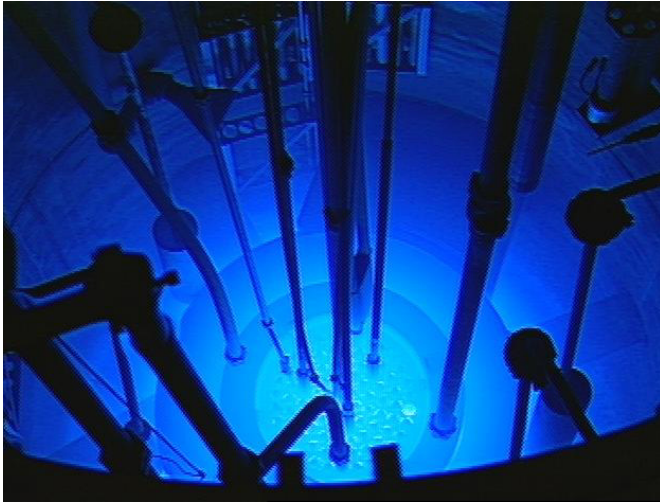
In the aftermath of the terrorist attacks on September 11, 2001, the NRC issued multiple safeguards advisories to enhance the security of spent fuel transportation and shipments of large quantities of radioactive material. These advisories recommended that licensees implement additional security measures during shipments, including enhanced preplanning and coordination with the affected States, additional advance notification of shipments, enhanced control and monitoring of shipments enroute, trustworthiness checks for individuals who have access to the shipment or to information about the shipment, and enhanced information security measures for shipment routes and schedules. Licensees fully adhered to these advisories. In addition, the NRC required enhanced security measures for spent fuel shipments from power reactors as well as research and test reactors beginning in 2002.



The NRC has also adjusted the security measures for shipments to reflect changes in the HSAS threat level. For example, during a period of heightened security in March 2003, the NRC issued advisories suspending spent nuclear fuel shipments and requesting that licensees defer large shipments of radioactive material, unless the shipments supported medical treatments for life-threatening conditions or were necessary for national security. The NRC also worked with other Federal agencies, State authorities and industry to clarify what shipments met these categories and identify those that could be resumed.

The NRC has also supported efforts by the DHS Bureau of Customs and Border Protection (CBP) and the USCG to begin advance electronic notifications of dangerous goods crossing U.S. borders and to implement regulations concerning port and facility security. Additionally, the NRC now collects and shares information on shipments of large quantities of radioactive material with the CBP National Targeting Center.

In parallel with these enhancements, the NRC has assessed the potential vulnerabilities and mitigating strategies for a spent fuel rail transportation package design, a spent fuel truck package design, and six radioactive material package designs. The NRC evaluated the response of the various packages to ground assault tactics consistent with the radiological sabotage DBT, including a range of explosive threats.



Research and Test Reactors

Background

Compared to power reactors, research and test reactors pose significantly less risk of radiological exposure to the public. Consequently, NRC has historically tailored the security requirements and oversight consistent with those lower risks. Following the terrorist attacks on September 11, 2001, the NRC promptly advised research and test reactor licensees to implement the highest level of security to protect against radiological sabotage and theft of certain nuclear fuel. NRC also advised research and test reactor operators to consider taking certain additional security measures. The NRC then verified that appropriate security measures were in place to protect research and test reactor facilities from theft or sabotage.

Current Program and a Look Forward

The NRC is continuing to work with the research and test reactor community to further improve security and evaluate whether such facilities have vulnerabilities that warrant additional preventive or mitigating measures. Two main factors are considered in establishing the additional security measures for research and test

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reactors. First, the generally small radioactive inventory and low potential radiological consequences associated with research and test reactors make it unlikely that a terrorist attack could compromise public health and safety by causing radiation exposure. Second, each licensee is implementing site-specific security plans because each research and test reactor facility is unique in design, operation, use, location, and other important characteristics. The NRC's requirements for security measures at research and test reactors are graded to account for the size of each reactor. In August 2002, the NRC provided guidance on protective measures that are appropriate for the different threat conditions (action levels) corresponding to the HSAS.

The NRC is also working with licensees and DOE to evaluate steps to reduce the inventories of reactor fuel, including fuel containing high enriched uranium, at research and test reactors. The NRC continues to work with DOE, licensees, and State and local authorities to ensure that any transportation of spent nuclear fuel to and from research and test reactors is performed safely and securely.



Enhancements to Materials Security

Background

The NRC has longstanding regulatory programs to ensure the security of NRC-licensed radioactive materials. These programs provide the greatest protection to special nuclear material which, if stolen, could be used in an improvised nuclear explosive device. As a result, the NRC requires licensees to apply a graded level of physical protection and material control and accounting, depending on the relative potential consequences posed by the given radioactive material.

Another important responsibility involves ensuring the security of radioactive materials that the NRC licenses for medical, academic, and industrial uses. There are millions of radioactive sources in the U.S., with approximately 21,000 specific licensees, and many thousands of general licensees who possess and use radioactive sources of various types and quantities. Nonetheless, only a small fraction (fewer than 10 percent) of the licensed materials poses a significant terrorist target for malevolent use in a Radiological Dispersal Device (RDD) or Radiological Exposure Device (RED), a device that could covertly expose individuals to a large and potentially lethal dose of radiation. The NRC also works with Agreement States, which administer regulatory programs to ensure the safety of radioactive materials that are used for medical, industrial, and academic purposes within their respective States.

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Current Program and a Look Forward

Shortly after the terrorist attacks on September 11, 2001, the NRC recognized the elevated threat to radioactive sources and issued numerous advisories to licensees in possession of large sources of radioactive material that might be attractive to terrorists for use in RDDs or REDs. Those advisories identified practical measures to enhance security against terrorist threats and were intended to augment existing security programs that had been geared more to radiation protection. In 2002, the Commission and the Secretary of Energy convened an NRC-DOE working group to evaluate and identify measures to enhance the security of radioactive sources. That effort culminated with the publication of a joint report that identified the most attractive radioactive sources (“high-risk” sources) and measures that should be taken to increase their security, including prompt dispositioning of unwanted sources and enhanced tracking of high-risk sources. This report was published in 2003 and is entitled, *Radiological Dispersal Devices: An Initial Study to Identify Radioactive Material of Greatest Concern and Approaches to Their Tracking, Tagging, and Disposition*.

The joint NRC-DOE report also provided the foundation for systematically evaluating upgrades to the security of high-risk sources. As a result, the NRC’s overall approach focuses on radioactive materials that pose the greatest concern if used in an RDD or RED. To accomplish that, the NRC is working to ensure that such attacks are prevented by identifying, adequately securing, and appropriately monitoring radioactive materials of greatest concern. The NRC is assisting response organizations in their preparation for a potential RDD attack to limit consequences of events. In addition, the NRC is working with international and domestic organizations to address RDD issues in an integrated, consistent manner through communication and coordination. More detailed information on that project is presented in the “International Safeguards and Security” section in this report.

Working with State radiation control programs, the NRC has required materials licensees to enhance security for panoramic irradiators (June 2003) and manufacturers and distributors of high-risk radioactive sources (January 2004). The NRC is also currently developing security enhancements for other lower-risk radioactive sources. The NRC expects to complete these enhancements by the end of 2004. In addition, the NRC and the States are using the results of ongoing VAs to identify and assess the need for mitigating measures and controls for other categories of licensees who possess high-risk sources. The NRC issues advisories to licensees during periods of heightened threat, and licensees implement security enhancements, shipping schedule changes, or other measures as needed to ensure the continued safety of the public.

The NRC, DOE, and the States are also developing a national source tracking system. The NRC, with DOE, other Federal agencies, and States, have also accelerated the collection of unwanted radioactive sources. The National Nuclear

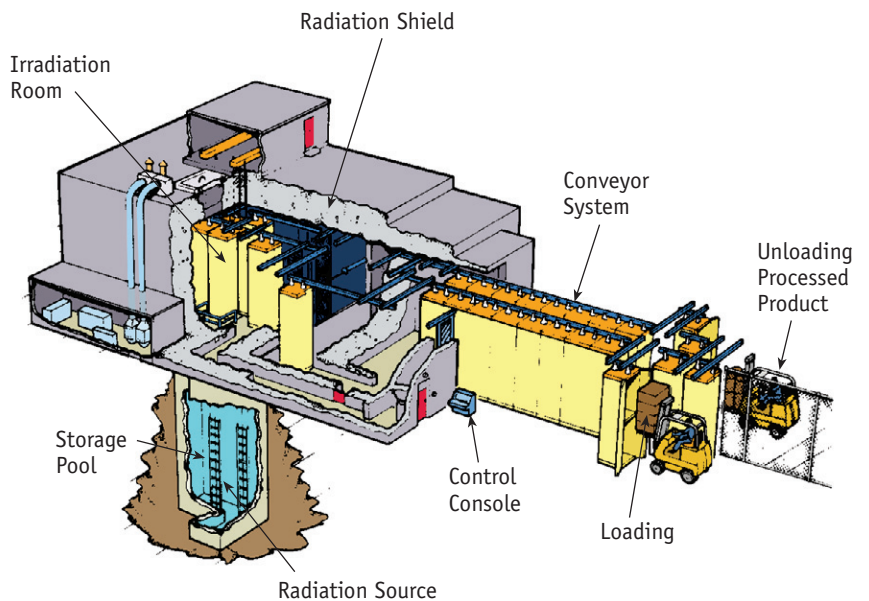
Security Administration's Offsite Source Recovery Program is playing a vital role in identifying, collecting, and disposing of stolen, lost, and orphaned radiological sources that are no longer wanted or have exceeded their useful life. More than 5000 radioactive sources have been recovered in the past 20 months. The DOE also has a program to recover orphan sources overseas.

The NRC and its licensees also have taken steps to increase the security of export/import controls for high-risk sources, and the NRC is currently evaluating alternative forms of radioactive materials that may reduce their attractiveness for use in an RDD. The NRC has also coordinated with international and domestic partners to discuss possible methods to make high-risk sources less vulnerable to malevolent use. In addition, NRC staff representatives have also actively participated in international arenas to enhance source security worldwide. Additional information on international source security is presented in the "International Safeguards and Security" section in this report.

The NRC is reviewing the existing Material Control and Accounting (MC&A) program to provide a fresh and objective assessment of current NRC regulations and practices in this area, including inspection programs for nuclear material licensees. The review includes technical assessments of the adequacy of existing controls, along with interviews with current and former NRC staff who are knowledgeable in the MC&A area, and visits to representative nuclear facilities to examine current controls and practices. The NRC staff recommendations resulting from the review will be submitted to the Commission in 2005.

The NRC is also working with DOE to upgrade the Nuclear Material Management and Safeguards System (NMMSS), which was developed and implemented decades ago to track transfers and inventories of special nuclear material, source material from abroad, and other material. Approximately 180 NRC-licensed facilities are authorized to possess plutonium and enriched uranium in quantities ranging from a kilogram to multiple tons. These licensees verify and document their inventories in the NMMSS database. There are several hundred additional sites licensed by the NRC or State governments that possess plutonium and enriched uranium in smaller quantities typically ranging from a gram to tens of grams. The NRC is currently working with these licensees to confirm the accuracy of inventories to provide increased confidence in the location and quantity of plutonium and enriched uranium held by NRC and Agreement State licensees.

Commercial Gamma Irradiator



In addition, consistent with the systematic review of agency security programs, the NRC has undertaken a series of assessments of potential vulnerabilities and mitigating strategies for materials licensees. Through these facility- or material-specific VAs, the staff is examining potential consequences beyond those that are already evaluated in the licensing process or that could result from the loss of control of radioactive material. Vulnerabilities of structures, process and protective systems, security operations and physical protection systems, information systems, MC&A systems, and access control systems vulnerabilities are being assessed, as applicable. Ultimately, the staff will integrate the results of individual VAs into one risk-informed VA for materials licensees to support decisions about protective strategies for each type of facility. In addition, the staff is also developing recommendations for regulatory enhancements based on this integrated risk-informed approach for materials licensees.



International Safeguards and Security

Code of Conduct on the Safety and Security of Radiological Sources

Background

Before the terrorist attacks on September 11, 2001, the use and international commerce of radiological sources (other than radiological sources with special nuclear material or source material) was of concern primarily from a health and safety perspective. The NRC authorized exports and imports of sealed sources and bulk material under a general license. Beginning in 2000, the International Atomic Energy Agency (IAEA) Member States began the development of a *Code of Conduct on the Safety and Security of Radioactive Sources* (the Code of Conduct).

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Pursuant to the Atomic Energy Act of 1954 (as amended) and the Energy Reorganization Act, the NRC is the U.S. competent authority for regulating radioactive material associated with sealed sources. Except for naturally occurring radioactive material and material under the control of DOE, the NRC has the authority within the U.S. to regulate all aspects related to radioactive sealed sources, including issuing general or specific licenses to receive title to, own, acquire, deliver, receive, possess, use, export, import or transfer such material.

Together with DOE and the U.S. Department of State (DOS), the NRC has worked with the international community to define the radionuclides of concern and action levels for those radionuclides that represent the highest risk for potential malevolent use by a terrorist. Toward that end, the NRC worked to define high-risk radioactive sources to ensure consistency between domestic and international programs as described by the IAEA in its draft TECDOC-1344, which provides the supporting technical basis for IAEA's *Code of Conduct on the Safety and Security of Radioactive Sources*. The revised text of the non-legally binding Code of Conduct was approved by the IAEA Board of Governors and endorsed by the General Conference in September 2003 (GC(47)/RES/7.B), and published as IAEA/CODEOC/2004 in January 2004.

In April 2004, representatives on the Nuclear Safety and Security Working Group of the Group of Eight (G-8) industrialized nations met to discuss the guidance document associated with implementing the export/import provisions of the Code of Conduct. The U.S. Government, as president of the G-8 in 2004, was able to obtain G-8 consensus on both a revised text and a commitment of support to implement the Code and its guidance after December 2005. The NRC continued in its national Federal leadership role on security of radioactive sources in the U.S. in its endorsement of the Code of Conduct, which marks the culmination of developments and efforts spanning the past several years of increased international consensus regarding the strengthening of controls on radioactive sources. The guidance developed at the G-8 Summit will be considered for approval by the IAEA Board of Governors in September 2004.

In late 2003, the NRC staff coordinated with international and domestic partners to discuss with manufacturers of radioactive sources and devices possible methods that would make high-risk radioactive sources more secure and less vulnerable to dispersion or dismantling by persons with malicious intent. In addition, NRC representatives met with manufacturers to discuss improved methods of validating legitimate purchases of radioactive sources and ensuring that such sources are only distributed to authorized users who are operating within an appropriate regulatory regime. Discussions also raised concern regarding arrangements for ensuring appropriate return or disposal of spent sources and developing a Code of Practice for manufacturers and suppliers, to define their roles and responsibilities during the life cycle of high-risk sources.

The NRC staff also continues to take the lead in the technical and legal arena to further develop internationally harmonized guidance for implementing the recommendations of the Code of Conduct in relation to the import and export of the highest-risk radioactive sources listed in Categories 1 and 2 of the Annex to the Code. This guidance is designed to not impede international cooperation or commerce, as long as such cooperation and commerce does not contribute to the use of such sources for purposes that threaten safety and security.

The NRC is currently pursuing regulatory improvements in alignment with the Code of Conduct. These improvements include developing a national source registry and revising the requirements for the import and export of byproduct material. The NRC has already developed an interim database of current source inventories, which is substantially complete.

In addition, the Commission has approved a proposed rule regarding enhanced controls over the import and export of high-risk sources. Unlike the Code of Conduct, the NRC's proposed rule includes bulk material as well as sealed sources. The Commission intends to have a final rule issued by the end of 2004, and licensees will then have six months to come into compliance. Whereas such byproduct material was previously imported and exported under general licenses, under the new rule licensees will be required to apply for specific licenses, and will have to document that the end user is authorized to possess the material. Licensees will also have to provide prior notice of shipments. For the export of high-risk sources, the NRC, drawing on information from DOS and the IAEA, will have to assess and make a determination whether the importing country's regulatory infrastructure is adequate to maintain continuous control over the material. (In cases of import of high risk sources, the NRC will provide the needed consent.) In countries without adequate regulatory controls, the Code of Conduct provides for "exceptional circumstances" under which high-risk sources can be exported with additional conditions imposed on the licensee.

International Safeguards

Background

The NRC conducts international safeguards activities to demonstrate the U.S. commitment to nonproliferation of nuclear materials, and to strengthen the IAEA's capability to verify a State's commitments on the peaceful use of nuclear materials and to prevent the spread of nuclear explosives capability. The NRC supports the strengthening of the IAEA safeguards program through participation in inter-agency groups as well as in activities directly supporting the IAEA.

Current Program and Look Forward

NRC's involvement in the IAEA's international safeguards and nonproliferation activities are implemented through cooperative technical work with other Federal



IAEA Headquarters located in Vienna, Austria

agencies, other countries, and the IAEA. The following NRC activities support the IAEA safeguards program:

- Implementation of US-IAEA Safeguards Agreement through monthly IAEA safeguards inspections, which are conducted at a high-enriched uranium downblending facility. Similar inspections are also planned in the near future for centrifuge enrichment facilities. The U.S. demonstration of commitment to IAEA safeguards for these proliferation-sensitive facilities will support the IAEA's efforts to implement safeguards in similar facilities in countries of concern.
- Implementation of the Additional Protocol to U.S.-IAEA Safeguards Agreement, for which the U.S. Senate provided its consent for ratification in March 2004. Approximately 90 countries have signed Additional Protocols and approximately 60 have brought them into force. Bringing the U.S. Additional Protocols into force is important to demonstrate our commitment to strengthened IAEA safeguards and to strengthen the IAEA's and U.S.'s ability to encourage other countries to bring Additional Protocols into force.
- Participation in interagency technical efforts to strengthen IAEA safeguards and integrate the new measures into the IAEA safeguards system. The U.S. Subcommittee on International Safeguards and Monitoring develops and facilitates U.S. policy on IAEA safeguards and related nonproliferation issues and meets with the IAEA and other governments to coordinate U.S. Government policy and implementation activities. Bilateral meetings are held with U.S. allies to coordinate policy positions and approaches for strengthening IAEA safeguards. The meetings provide a forum for the U.S. to espouse new policy initiatives, such as the President's Initiative for Combating Proliferation of Weapons of Mass Destruction, as well as coordinating on policy issues before the IAEA Board of Governors, sharing experiences with implementing IAEA safeguards, coordinating technical support tasks, and providing results of U.S. technical evaluations on issues.



International Physical Protection

Background

Since 1998, the U.S. has led an effort to revise the Convention on Physical Protection of Nuclear Material (CPPNM) to strengthen obligations for the physical protection of nuclear material in domestic use, storage, and transport, and for the protection of nuclear material and nuclear facilities from sabotage. Physical protection bilateral visits are conducted by NRC staff as part of a U.S. interagency team with those countries possessing nuclear materials carrying U.S. obligations. The NRC also hosts meetings and tours to demonstrate U.S. physical protection practices. In addition, NRC participates on International Physical Protection Ad-

visory Service (IPPAS) missions to assist countries in strengthening the effectiveness of their national physical protection system. Furthermore, the NRC consults with the nuclear regulators in the former Soviet Union countries to improve capabilities to assure the effective control and protection of nuclear materials.

Current Program and Look Forward

In March 2003, international legal and technical experts met at IAEA and drafted possible amendments to the CPPNM, but further consultations are needed to identify a proposal that could serve as a basis for convening a successful diplomatic conference. NRC plans to continue its participation in this activity.

NRC participates in four to five physical protection visits to other countries per year to review the protection of U.S.-obligated nuclear materials. Also, NRC routinely supports one IPPAS mission per year. Assistance to the former Soviet Union republics is conducted in coordination with DOE.

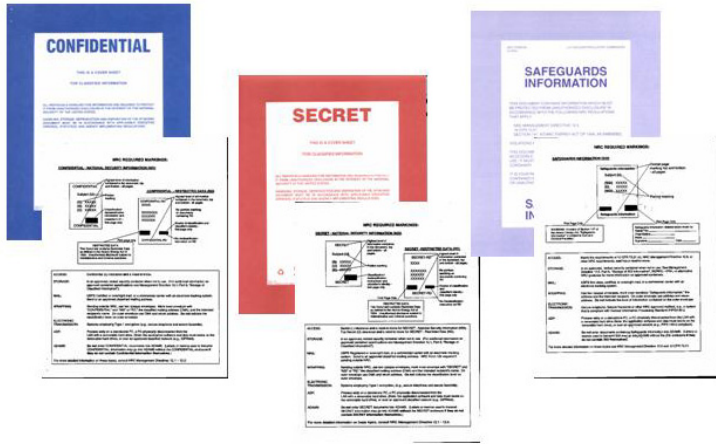
Export License Reviews and Cooperation Agreements

Background

The Atomic Energy Act requires NRC to review export license applications for compliance with the international safeguards and physical protection license conditions. Also, to maintain compliance with Agreements for Nuclear Cooperation with other countries, NRC is required to verify that the U.S. facility importing nuclear material is prepared to effectively protect the material, verify the tamper-indicating devices on containers, and maintain material accountancy information on the nuclear material.

Current Program and Look Forward

NRC reviews facilities receiving imports and exports of nuclear materials to ensure that the materials will be effectively protected against a subnational theft or diversion event and to ensure that the IAEA could detect diversion of the U.S.-obligated nuclear material from peaceful uses. The loss of control of nuclear materials in international commerce could have potential impacts to the health and safety of the public and security in the U.S.



Enhancements to the Protection of Sensitive Information

Background

The NRC protects classified and sensitive unclassified information both internally and externally through administrative procedures and requirements in accordance with Federal law and national programs.

Current Program and a Look Forward

Following the terrorist attacks on September 11, 2001, the NRC identified the need to rapidly communicate classified and sensitive unclassified information among NRC headquarters, regional offices, and licensee personnel. NRC actions in this area have been closely coordinated with DHS, DOE, and other Federal agencies in the area of secure communications, homeland security and incident response. As a result, the NRC enhanced communication capabilities and developed a program that enables the NRC to routinely share classified and

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sensitive unclassified information with authorized licensee representatives up to the SECRET- National Security Information level. As part of the program, the staff coordinated with DOE to provide Foreign Ownership, Control, or Influence analyses for the NRC so that the NRC may grant facility security clearances to licensees having access to classified information. To date, the NRC has issued facility security and personnel clearances to nuclear power plant sites. The NRC has also significantly enhanced secure communication capabilities in headquarters and the regional offices.

The NRC has obtained additional secure communications connectivity with the National Command Authority, Federal Agencies, and the Department of Defense (DoD), to include high-speed secure faxing, secure video teleconferencing, improved secure voice equipment, and connectivity to two secure data networks.

The NRC also protects certain types of sensitive unclassified information that could be useful to a potential terrorist. To that end, the NRC has been enhancing the program for handling, transmitting, and protecting this information, including development of a Safeguards Information designation guide to enhance the consistency of designation decisions and improve training for NRC staff and contractors, who are responsible for protecting sensitive information. Additionally, the NRC approved equipment for several licensees to use in electronically transmitting Safeguards Information among their facilities and to the NRC. The NRC has also broadened the range and number of licensees that possess and use Safeguards Information (e.g., source and byproduct licensees). As a result, the NRC issued new security orders to materials licensees to establish requirements for handling and protection of "Safeguards Information-Modified Handling (SGI-M)," a designation that pertains to certain categories of information. The NRC and DOE developed the Yucca Mountain Classification Guide in June 2004 to comprehensively delineate what comprises sensitive unclassified, safeguards, and classified information with respect to Yucca Mountain. In addition, the NRC is developing additional comprehensive subject-specific classification guides for other areas to continue to ensure protection of classified and sensitive unclassified information.



Communications

Background

Effective external communications play a vital role in protecting our Nation's nuclear facilities from acts of terrorism. Nuclear power plant licensees have standing agreements with State and local government agencies and have incorporated these agreements into their contingency plans and response procedures. In addition, the NRC has maintained close coordination with appropriate Federal and State officials in Agreement and other States through working groups with representatives from the Organization of Agreement States and the Conference of Radiation Control Program Directors. NRC also routinely interacts with the U.S. Congress by providing monthly reports on NRC activities, briefings, and written responses to inquiries about specific topics and NRC programs, including nuclear security.

Current Program and a Look Forward

Since the terrorist attacks on September 11, 2001, the NRC has enhanced its communications and coordination both within the agency and with external entities, including Federal, State, and local agencies, and the private sector. Close coordination among the NRC, DHS, FBI, DOE, DoD, other Federal agencies, States, local authorities, and licensees that operate nuclear power plants and other significant nuclear facilities and activities is essential. NRC has enhanced communications and coordination in a wide variety of ways with its principal partners. For example, to allow faster and easier exchange of classified information with licensees and authorized Federal, State, and local officials, the NRC established a protected computer server system in February 2003 for the faster

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and easier exchange of such information. The NRC is working closely with stakeholders in the Federal, State, and private sector communities to ensure that its security programs reflect their needs in the current threat environment.

In addition to regular and frequent communication with DHS, the NRC regularly communicates with other Federal agencies such as the TSA, Federal Aviation Administration (FAA), FBI, DOE, and DoD on both policy and program matters, as well as operational responses to specific threats. This coordination has been instrumental in accomplishing rapid responses and short-term protections for nuclear facilities, and lays the foundation for ongoing national efforts to deter, detect, prevent, disrupt, and respond to terrorist attacks.

In June 2003, the NRC and DHS cosponsored a two-day Homeland Security Workshop on civilian nuclear security and incident response, which was attended by approximately 300 Federal and State government officials. The workshop further strengthened NRC and DHS linkages with these key officials by increasing and strengthening awareness of DHS and NRC initiatives related to homeland security and incident response. In the fall of 2004, the NRC plans to conduct a series of workshops in each NRC region to increase our partners' awareness of security and National Response Plan initiatives.

Contacts and liaison with the Intelligence Community have been and will continue to be essential to maintain a real-time knowledge of potential threats to NRC-licensed facilities and to make decisions regarding changes to the design basis threats. The NRC recognizes that response actions for the many levels of State and Federal agencies and private sector entities may overlap to some extent. Consequently, the NRC is working closely with those that are key in responding to threats at nuclear facilities, in order to ensure efficient and effective response, including integration of response plans at the Federal and State levels.



The NRC is also dedicated to sharing information among organizations and licensees with a need to know to enhance prevention and response to terrorist and other security incidents. The NRC has a long history of promoting openness in its regulatory and decisionmaking processes. However, in protecting our Nation, the NRC remains diligent in preventing terrorists from gaining access to sensitive information. Consequently, the NRC must balance its commitment to openness with the need to prevent releases of sensitive information. NRC will continue to explore areas in which sharing information with Federal and State agencies, licensees, and the public will result in a better-informed, better-prepared Nation.



Emergency Preparedness and Response to Terrorist Attacks

Background

Since the accident at Three Mile Island in 1979, NRC has heightened its regulatory oversight and made sweeping changes in emergency response planning and nuclear power plant operations. Over the years since that accident, the NRC has responded to domestic radiological events and security matters, overseen licensees' emergency preparedness, and supported and coordinated with other Federal, State and local response organizations. The NRC has also maintained staff on-call and around-the-clock at the NRC Headquarters Operations Center. These actions have been performed in coordination with other Federal agencies under the NRC's Incident Response Plan and Federal Radiological Emergency Response Plan (FRERP). For more than 20 years, the NRC, in conjunction with the Federal Emergency Management Agency, has conducted a comprehensive

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emergency exercise program with NRC licensees. This program includes participation by State and local response organizations and other agencies of the Federal government.

Current Program and a Look Forward

As a result of the attacks on September 11, 2001, the NRC has increased its focus on potential terrorist scenarios as initiating events in emergency preparedness. It should be noted that NRC's response to a radiological release—whether caused by a terrorist attack, equipment malfunction, or natural disaster—could be similar, even though each type of event may have unique concerns. As part of the Orders issued in February 2002, nuclear power plant operators were required to make enhancements in several areas of emergency preparedness, including emergency response facilities, emergency response organizations, classification of and response to credible threats, and evaluation of a broader range of hazards. Nuclear industry groups and Federal, State, and local government agencies assisted in the prompt implementation of these measures and participated in drills and exercises to test new planning elements. Since that time, the NRC has reviewed licensee commitments to address these requirements and verified the implementation by direct inspection.

As part of the NRC's transitional FOF exercises at nuclear power plants, the NRC is evaluating the licensees' emergency preparedness response concurrent with their security response. Licensees have improved their emergency preparedness response capabilities through the identification of areas for improvement during these exercises. Licensees have also shared lessons learned with other licensees, States, and local response organizations.

In addition, the NRC conducted a formal evaluation of the emergency preparedness planning basis in view of the threat environment that has existed since the terrorist attacks on September 11, 2001. This evaluation addressed all aspects of nuclear power plant emergency preparedness requirements. In doing so, the evaluation determined that emergency preparedness at nuclear power plants remains strong, but identified several areas for improvement. These areas included communications processes, resource management issues, drill program enhancements, and changes to NRC guidance documents used by licensees. The NRC is currently reviewing and inspecting these improvements. Additionally, the NRC recognizes the importance of bolstering communication of its emergency preparedness activities with internal and external stakeholders including the public, the industry, the international nuclear community, as well as Federal, State and local government agencies. The NRC continues to emphasize the importance of emergency preparedness to mitigate the effects of potential security threats and other events.

As part of the overall improvement of emergency response capabilities, the NRC has improved the Headquarters Operations Center, where the NRC directs

emergency response activities. The NRC Operations Center is continually staffed with knowledgeable personnel, who have the expertise and ability to evaluate events and alert NRC management, other Federal partners, and licensees, as necessary, about unfolding events. The NRC has added secure video teleconferencing in the Operations Center, as well as increased the capacity for secure communications and classified information storage. In the four NRC Regional offices, the Regional Incident Response Centers also have similarly undergone substantial improvements, including additional space and improved communications capability. The NRC also continues to improve coordination with other Federal agencies to refine Federal plans for response to an emergency or terrorist event involving nuclear materials or facilities. NRC actively takes part in Federal interagency exercises such as the Top Officials (TOPOFF) series to test and improve these plans.

The NRC is also playing an active role in enhancing Federal, State, and private sector incident response capabilities for nuclear and radiological emergencies and incidents. With the passage of the Homeland Security Act of 2002, the DHS has been vested with the overall responsibility for coordinating the Federal response to domestic incidents. The NRC has been actively working with DHS to develop and administer a National Incident Management System (NIMS) and National Response Plan (NRP) consistent with Homeland Security Presidential Directive 5 (Management of Domestic Incidents). The NRC, along with other Federal agencies, and NRC licensees regularly participate in exercises involving NRC licensed facilities. The NRC is also committed to greater use of security scenarios in exercises, such as the scenario used in the June 2004 exercise at Indian Point nuclear power plant. This commitment is not new to the NRC. The agency began to use security scenarios long before the September 11 terrorist attacks as illustrated by a drill involving considerable FBI field participation which was conducted at Palo Verde nuclear power plant in 2000. Additional information on the NRC's emergency response exercises is presented later in this document.

With respect to planning for Continuity Of Operations (COOP), the NRC has accelerated infrastructure enhancements at our alternative COOP site, tested backup capabilities, conducted an agency-wide COOP exercise, and participated in a National COOP exercise in May 2004. The NRC's COOP and Continuity of Government (COG) plans have been in place well before the terrorist attacks in 2001. In the future, the NRC expects to fully exercise the agency and national-level COOP capabilities to ensure readiness against potential terrorist attacks or other incidents that could disrupt operations. Additionally, the NRC plans to continue to participate in future COG exercises that enhance preparedness for the agency and the Nation.



When the NRC supplemented the DBTs in April 2003, the agency began discussing with DHS, the White House Homeland Security Council, FBI, DoD, and other agencies the potential need for an “integrated response” by government assets to help defend against threats that could exceed the DBTs. The concept of “integrated response” applies to both prevention of and response to a potential terrorist event. The NRC has a strong history related to the integration of responders, in both exercises and actual events and the agency is actively engaged in both prevention or deterrence and response elements of integrated response planning.

The NRC also continues to have an active role in a number of DHS initiatives to further prepare our Nation against potential terrorist attacks. In particular, NRC involvement includes participation in a number of Homeland Security Council policy coordinating committees, the Deputies Committee, the Federal Radiological Preparedness Coordinating Committee, the Federal Response Plan’s Emergency Support Function Leaders Group, numerous Federal interagency working groups (including development of the National Infrastructure Protection Plan), and NRC-initiated outreach activities with industry groups and State agencies. The NRC will continue to strengthen our partnerships with other Federal agencies to implement a national framework for domestic incident response.



Interagency Exercises

Background

The NRC has a long history of evaluating and participating in emergency exercises at nuclear power plants. In fact, NRC regulations require that nuclear power plant licensees participate biennially in large consequence management exercises (“plume phase”) and every six years in extended (“post-plume phase”) exercises for evaluation. The NRC has participated in many interagency exercises along with licensees, and State and local responders. A number of these exercises have also included large-scale Federal participation. However, before the terrorist attacks on September 11, 2001, only a limited number of these exercises contained simulated terrorist attacks.

Current Program and a Look Forward

In the threat environment that has existed since the terrorist attacks in 2001, the NRC has built upon the established exercise program with licensees to include participation in national-level, interagency, terrorism-related exercises. In addition, the NRC has responded to a number of events that required extensive interagency responses, including the electric power blackout in August 2003.

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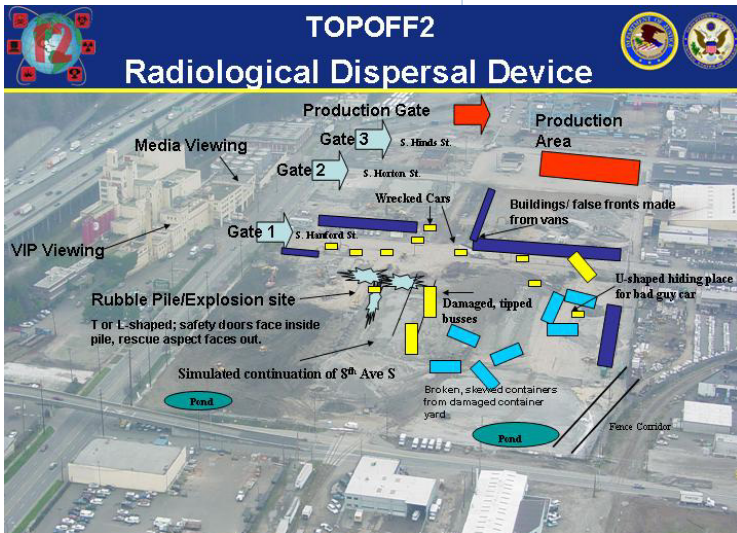
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The NRC has also begun upgrading our exercise program to more regularly incorporate security and counter-terrorism considerations into exercises. This initiative has improved both the NRC and licensee response capabilities.

In May 2003, the NRC's Headquarters and Regional Offices participated in Top Officials 2 (TOPOFF2), the second Congressionally-mandated, national-level exercise involving simulated weapons of mass destruction. Simulated exercise events focused on terrorist threats to licensee facilities, a radiological dispersal device detonation in Seattle, a lost highway shipment of radioactive material in the Pacific Northwest, and a bioterrorism attack in Chicago. TOPOFF2 provided the NRC with unique and valuable learning experiences that helped to enhance the NRC's response capabilities and preparedness for radiological and nuclear incidents. The NRC plans to participate in additional TOPOFF exercises.



In February 2004, the NRC participated in Unified Defense 04 (UD04), a major exercise conducted by the U.S. Northern Command (NORTHCOM) involving both DoD and non-DoD Federal departments and agencies, as well as a variety of State, and local agencies. This exercise focused on a hurricane of national significance, a general emergency at a NRC-regulated nuclear power plant resulting in radiological release to the environment and protective actions, including public evacuation, and detonation of a nuclear device by terrorists in southern Texas. Similarly, the NRC supported Determined Promise 04, a U.S. NORTHCOM exercise in August 2004.

Although not an exercise, the most significant real-world incident involving the NRC, other agencies, and licensees since the terrorist attacks on September 11, 2001, was the electrical power blackout in August 2003. As the blackout raced across a multi-State area, grid instabilities caused the near-simultaneous automatic shutdown of nine nuclear power plants. During that incident, the NRC and licensees promptly responded to ensure public safety as part of a coordinated national response. The blackout, the first large-scale incident with simultaneous challenges to safety systems at multiple nuclear power plants, provided the NRC with valuable experience and insight for enhancing response capabilities.

The NRC will continue to participate in interagency exercises. The NRC also has an active role in developing a number of interagency exercises relevant to the agency's responsibilities and remains a valued Federal partner in the incident response community.

Organizational Enhancements

Background

For more than 25 years, the NRC has conducted effective nuclear security, emergency preparedness, and incident response programs. The NRC's Headquarters Operations Center serves as the focal point for communications, analysis, and response in support of State and local agencies during an emergency involving a U.S. nuclear power plant, research or test reactor, fuel cycle facility, or nuclear materials licensee. However, before the terrorist attacks in 2001, program responsibilities for nuclear security, incident response, and emergency preparedness were distributed among several headquarters offices.

Current Program and a Look Forward

The events on September 11, 2001, highlighted the need to examine the way the NRC is organized to carry out our safeguards, security, emergency preparedness, and incident response functions. After a thorough review of NRC's organizational structure, staffing, and training in the security and safeguards areas, the Commission determined that the agency would achieve greater efficiency and effectiveness by consolidating certain NRC safeguards, security, and incident response functions into an Office of Nuclear Security and Incident Response (NSIR). Therefore, the Commission established NSIR in April 2002. NSIR has aggressively increased staffing and agency expertise by hiring outside experts in security with civilian and military experience. NSIR staff expertise has been shared with other Federal organizations through detailing of staff to the Terrorist Threat Integration Center, the Office of Homeland Security, DHS, and others. In addition, the Commission named a Deputy Executive Director for Homeland Protection and Preparedness in June 2003, to review and resolve homeland protection and preparedness issues.

Since that time, the NRC and its many stakeholders have become increasingly aware of the importance of emergency preparedness to mitigate the effects of potential security threats. Along with this increased awareness, the NRC has acknowledged the need for increased communication of emergency preparedness activities with internal and external stakeholders including the public, industry, the international nuclear community, and Federal, State and local agencies. As a result, the Commission established the Emergency Preparedness Project Office in January 2004, and moved that office to NSIR in June 2004,

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to integrate emergency preparedness with emergency response and security. The establishment and placement of this organization reflects another step in the NRC's ongoing efforts to increase attention on activities that affect emergency preparedness. The Project Office is responsible for developing emergency preparedness policies, regulations, programs, and guidelines for both currently licensed nuclear reactors and potential new nuclear reactors.

Since September 11, 2001, the NRC has also enhanced the infrastructure of the Headquarters Operations Center to include additional staffing, improved emergency response procedures, and equipment upgrades. For example, the NRC increased personnel who continuously staff the Operations Center to receive, assess, and promptly respond to both safety and security incidents. The NRC has also revised our emergency response team procedures to incorporate specific NRC actions related to changes in the HSAS threat level.

Significant enhancements have been made to the Operations Center telecommunications capabilities, such as secure telephone and fax units, upgraded satellite phones, and an improved teleconferencing system. An alternate incident response center has been established at one of NRC's regional offices, with all the capabilities to assume the role of the Headquarters Operations Center in the event of loss of that facility. In addition, the NRC is continuing to expand the capabilities of the Headquarters Operations Center through the use of modern information technology systems, such as new display monitors, computer servers, specialized software applications, and secure video teleconferencing capability. Related enhancements have also been completed for response facilities in the four NRC's regional offices.



Legislation

Background

The NRC has accomplished the numerous enhancements to security and preparedness described in this report under existing Federal law. Over time, the NRC has proposed legislation to the U.S. Congress to allow the Commission to enhance nuclear security by granting arrest authority to security personnel at licensee facilities and the use of deadly force to strict Federal law, rather than State law. The proposed legislation would also make it a Federal crime to introduce dangerous weapons into nuclear facilities and to sabotage nuclear facilities during construction. Although both Houses supported these provisions in various legislative bills, they have not yet been enacted.

Current Program and a Look Forward

Following the terrorist attacks on September 11, 2001, NRC worked with its Oversight Committees on proposals to substantially enhance nuclear security through the enactment of more comprehensive legislation. The most important of the nuclear security proposals that have been introduced in the 108th Congress are as follows:

- Authorization of security personnel at NRC-regulated facilities and activities to receive, possess, and, in appropriate circumstances, use more powerful weapons important to defend against terrorist attacks [H.R. 6; S. 2095, H.R. 4503].

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- Expansion of the classes of NRC-regulated entities and activities whose employees are subject to fingerprinting and criminal history background checks [H.R. 6; S. 2095, H.R. 4503].
- Federal criminalization of unauthorized introduction of dangerous weapons into nuclear facilities [H.R. 6; S. 2095, H.R. 4503].
- Federal criminalization of sabotage of additional classes of nuclear facilities, fuel, and material [H.R. 6; S. 2095, H.R. 4503].
- Authorization for NRC to carry out a training and fellowship program to address shortages of individuals with critical nuclear safety regulatory skills [H.R. 6; S. 2095, H.R. 4503].
- Extension of NRC's authority to regulate discrete sources of accelerator-produced radioactive material and radium-226, materials not now covered by the Atomic Energy Act [S. 1043, S. 2763].



All but the last of these provisions are contained in H.R. 6, the “Energy Policy Act of 2003,” as approved by Congressional conferees.

The authority provided by additional legislation is important to enhance civilian nuclear security in this country. Prompt legislative enactment of the six provisions listed above would substantially enhance the protection of civilian nuclear facilities and materials.

Conclusion

As described briefly in this report, the NRC has made and will continue to make significant progress in enhancing homeland security and preparedness through working closely with DHS, other Federal agencies, State and local governments, and our licensees. Guided by our mission to protect the public health and safety, promote the common defense and security, and protect the environment, our objective is to implement an integrated, coordinated system for protecting our Nation.

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