

November 4, 2005

The Honorable Susan M. Collins, Chair  
Committee on Homeland Security and  
Governmental Affairs  
United States Senate  
Washington, D.C. 20510

Dear Madam Chair:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am writing in response to the Committee's request for information regarding the NRC's roles and responsibilities in preparing for and responding to Hurricane Katrina. I have enclosed specific responses to the questions raised in your letter of October 7, 2005. In addition, I have enclosed a copy of the written testimony I presented to the Senate Committee on Environment and Public Works on November 2, 2005.

The primary mission of the NRC, under the Atomic Energy Act of 1954, as amended, is to regulate the civilian commercial, industrial, academic, and medical uses of nuclear materials in order to ensure adequate protection of the public health and safety, and promote the common defense and security. The NRC actively prepares for and responds to incidents, including hurricanes and other natural phenomena, that may impact licensed facilities or materials.

Regarding Hurricane Katrina, the NRC took appropriate steps within its purview and in accordance with established emergency plans and procedures to prepare for and respond to the hurricane. Within its statutory authority and responsibilities, the NRC cooperated extensively with other Federal, State, and local agencies to support timely and effective implementation of the National Response Plan.

If you have additional questions regarding these matters, please contact me.

Sincerely,

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Nils J. Diaz

Enclosures:

1. Response to Questions
2. Written Testimony for the Hurricane Katrina  
Hearing, November 2, 2005

cc: Senator Joseph I. Lieberman

## Response to Questions

**Question 1(a): Describe each of the Commission's roles, responsibilities and authorities in providing emergency support functions under the National Response Plan. With respect to each specific role, responsibility or authority, please identify the statutory, regulatory or other source for that role, responsibility or authority.**

Answer:

Under the Atomic Energy Act (AEA) of 1954, as amended, the Commission has broad authority to regulate (through orders, regulations, and licensing) the possession and use of nuclear materials in order to ensure adequate protection to protect the public health and safety and promote the common defense and security. The Nuclear Regulatory Commission's (NRC) scope of responsibility includes regulation of commercial nuclear power plants; research, test, and training reactors; nuclear fuel cycle facilities; medical, academic, and industrial uses of radioactive materials; and the transport, storage, and disposal of nuclear materials and wastes. The NRC's emergency preparedness and incident response authority flows primarily from the Atomic Energy Act, and the NRC has developed regulations under that authority in various parts of Title 10 of the *Code of Federal Regulations*. Reorganization Plan No. 1 of 1980 also transfers to the NRC Chairman all functions pertaining to an emergency involving NRC-licensed or regulated materials and facilities.

The National Response Plan (NRP) and associated annexes (Emergency Support Function Annexes, Support Annexes, and Incident Annexes) govern the Federal Government's overall response to domestic incidents. As a signatory to the NRP, the NRC has committed to the national-level policies, concepts, processes, and structures identified therein. Within its statutory responsibilities and authority, the NRC has committed to meeting the requirements of Homeland Security Presidential Directive 5 (HSPD-5), "Management of Domestic Incidents," and coordinating and supporting its responsibilities identified in the NRP and associated annexes.

The NRP's Nuclear/Radiological Incident Annex provides for timely, coordinated response by Federal agencies to nuclear and/or radiological incidents and is the principal part of the NRP applicable to the NRC. The annex applies to any nuclear or radiological incident that has actual, potential, or perceived radiological consequences and requires a response by the Federal Government. The annex does not create any new authorities or change any existing authority, and nothing in the annex alters or impedes the ability of the NRC or other Federal agencies to carry out their specific authorities and perform their responsibilities under law. Under this annex, the NRC's roles and responsibilities are analogous to those under the Federal Radiological Emergency Response Plan, which was superseded by the NRP.

The Nuclear/Radiological Incident Annex may be implemented (1) concurrently with, and as an integral part of, the NRP for Incidents of National Significance (INS) or (2) independently as a stand-alone Federal interagency protocol for incidents below the threshold of an INS. Under the annex, NRC is either the Coordinating Agency or a Cooperating Agency. The NRC is the Coordinating Agency for incidents that occur at fixed facilities or activities licensed by the NRC or Agreement States or involving AEA licensed material.

As the Coordinating Agency, NRC performs the following Federal-level functions:

(1) coordinates actions of Federal agencies related to the overall response; (2) coordinates Federal activities related to response and recovery of the radiological aspects of the incident; (3) coordinates security activities related to Federal response operations; (4) ensures coordination of technical data (collection, analysis, storage, and dissemination); (5) ensures that Federal protective action recommendations are developed and provides advice and assistance to State, local, and tribal governments for implementation; (6) coordinates release of Federal information to the public; (7) coordinates release of Federal information to Congress; (8) informs the White House on aspects of the incident; and (9) ensures coordination of demobilization of Federal assets. For an INS, Department of Homeland Security (DHS) is responsible for the overall coordination of Federal response activities, and NRC performs the Coordinating Agency response functions in concert with DHS.

As a Cooperating Agency, the NRC provides technical and resource support to the Coordinating Agency. The NRC is a Cooperating Agency for all nuclear/radiological incidents other than those for which it is the Coordinating Agency. For example, for incidents involving Department of Energy (DOE)-owned/operated facilities, NRC provides technical assistance to other Federal, State, local, and tribal agencies as a Cooperating Agency in support of DOE as appropriate and consistent with the agency's authorities and responsibilities.

For incidents requiring Federal response under the NRP that do not involve nuclear and/or radiological facilities or materials, the NRC may be designated a "support agency" or "cooperating agency" under one or more of the Emergency Support Function (ESF) Annexes, Support Annexes, and/or Incident Annexes. For example, the NRC is identified as a support agency under ESF #3 - Public Works and Engineering, ESF #5 - Emergency Management, ESF #10 - Oil and Hazardous Materials Response, ESF #12 - Energy, and ESF #15 - External Affairs. Accordingly, the NRC would provide technical assistance and support according to the provisions of the annexes as appropriate and consistent with NRC's authorities and responsibilities.

**Question 1(b): Describe each of the Commission's roles, responsibilities and authorities in providing emergency support functions under the National Response Plan. With respect to each specific role, responsibility or authority, please identify the component or components within the Commission involved in acting pursuant to that authority or discharging that role and responsibility.**

Answer:

The components within the Commission involved in providing emergency support functions under the NRP are described in established NRC procedures. The use of established procedures ensures that the NRC's response to incidents and emergencies involving NRC licensees and Agreement State licensees is consistent with the NRC mission, compatible with NRC licensee responsibilities, supportive of the emergency response functions of State and local governments, and coordinated with the responses of other Federal agencies.

For this purpose, the overarching document is NRC Management Directive (MD) 8.2, "NRC Incident Response Program." It ensures that the NRC response to security and safety events is consistent with the national response strategy identified in the NRP and the National Incident Management System (NIMS). MD 8.2 is also used to establish and implement the NRC Incident Response Plan (NUREG-0728, Revision 4); both documents are posted on the NRC's public website, [www.nrc.gov](http://www.nrc.gov).

NUREG-0728 is in alignment with the NRP and reflects Commission policy. It identifies NRC organizational responsibilities and specifies organizational units that will provide assistance, commit resources, and manage the NRC response to incidents and emergencies involving regulated facilities and materials. It also governs the overall NRC response to radiological incidents and emergency events with a focus on those incidents involving NRC licensees and certificate holders. In addition, it provides the basis for the NRC's incident-related interface and coordination with licensees and other stakeholders. Although it is focused on incidents involving facilities and materials licensed by the NRC or an Agreement State, it encompasses all incidents in which the NRC has a response role under its statutory authorities or as part of the overall Federal Government response.

Regarding the organizational structure for emergency support functions under the NRP, the NRC Chairman typically serves as the Director of the Executive Team, which is the senior decision-making body for incident response. The Chairman has ultimate authority for all NRC functions pertaining to an emergency involving an NRC licensee. The Chairman may delegate, in whole or in part, his authority to another Commissioner or the NRC staff.

The Executive Team leads the agency's response under its statutory authorities and its responsibilities under the NRP, supports and assists decision-making to assure that risk to the public is minimized, and communicates appropriateness of actions to protect the public to Federal departments/agencies, Congress, media, and other stakeholders. The Executive Team's essential functions are (1) support licensees and State/local/tribal decision makers to assure that radiological consequences are minimized and (2) communicate and coordinate effectively with Federal stakeholders.

The NRC maintains a designated incident response organization at its Headquarters office in Rockville, Maryland and its four Regional offices (Region I: King of Prussia, Pennsylvania; Region II: Atlanta, Georgia; Region III: Lisle, Illinois; Region IV: Arlington, Texas). This organization is composed of multiple response teams with specific functions. Regional incident response is under the leadership of the respective Regional Administrator with oversight by the Executive Team.

Further information on NRC's incident response organization is provided in the response to Question 1(c).

**Question (1c): Describe each of the Commission's roles, responsibilities and authorities in providing emergency support functions under the National Response Plan. With respect to each specific role, responsibility or authority, please identify the key personnel involved in acting pursuant to that authority or discharging that role and responsibility.**

Answer:

As stated in the response to Question 1(b), the Chairman has ultimate authority for all NRC functions pertaining to an emergency involving an NRC licensee. The Chairman may delegate, in whole or in part, his authority to another Commissioner or the NRC staff.

Once the NRC Incident Response Plan is activated, the following positions and teams may be staffed:

- Executive Team led by the Director (NRC Chairman or designee, typically a Commissioner) and the Deputy Director (appointed by the Director, typically the Executive Director for Operations).
- Protective Measures Team monitors and independently determines potential radiological exposure to the public and provides assistance to licensees and governmental agencies in determination of public protective measures.
- Reactor Safety Team assesses the reactor licensee actions to ensure safety and project future conditions.
- Safeguards Team assesses licensee actions to ensure safeguards/security and coordinate security response with law enforcement and intelligence agencies.
- Liaison Team provides liaison with DHS and other Federal departments/agencies and Members of Congress; communicates and coordinates with Federal agencies, State governmental agencies, and other stakeholder organizations and also communicate with media representatives and the public.
- Operations Support Team provides administrative support for the effective functioning of the NRC response organization.
- Fuel Cycle Safety Team assesses the fuel cycle licensee actions to ensure safety and project future conditions.
- Site Team is dispatched from an NRC Regional office to the affected site. The Site Team Director is delegated response authority by the Executive Team Director once the team arrives at the site. Responsibilities include monitoring licensee activities, interacting with State and local authorities, and coordinating other Federal agencies.

NRC Regions I, II, III, and IV maintain an incident response program under the leadership of the respective Regional Administrator with oversight by the NRC Headquarter's Executive Team. The Regional Incident Response Organizations include teams that are similar to those described above. In addition, Regional response organizations include resident inspectors at nuclear power plants and nuclear fuel facilities. For an incident at a licensee site with resident inspectors, the inspectors typically receive prompt notification from the licensee, monitor the licensee's response, and communicate with the respective Regional office.

Separately from the NRP, the NRC continually staffs its Headquarters Operations Center (24 hours a day, 7 days a week, 365 days a year) with both a Headquarters Operations Officer (HOO) and a Headquarters Emergency Response Officer (HERO). The HOO and HERO function as a team to receive emergency and non-emergency notifications from NRC licensees, government agencies, and/or private entities. Depending upon the nature of the reported incident, the HOO and HERO notify designated headquarters and regional management-level decision makers. If a decision is made to escalate the NRC response mode, the HOO and HERO promptly notify the appropriate NRC incident response team members. In addition to internal notifications, notification is made to other Federal departments/agencies and, if appropriate, licensees and Members of Congress and State agencies.

**Question 2(a): To the extent not provided in response to the previous question, please describe any other roles, responsibilities and authorities of the Commission in preparing for and responding to a domestic emergency. With respect to each specific role, responsibility or authority, please identify the statutory, regulatory or other source for that role, responsibility or authority.**

Answer:

The NRC has several roles, responsibilities, and authorities for preparing for and responding to a domestic emergency. For nuclear power plants, emergency preparedness begins with robust facility designs. Part 50 of Title 10 of the *Code of Federal Regulations*, "Domestic Licensing of Production and Utilization Facilities," requires that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions. These requirements are an integral part of our preparations for severe natural phenomena that are taken far in advance of severe natural phenomena occurring. Prior to a plant being licensed for operation, the NRC reviews the adequacy of the plant design to withstand natural phenomena as described in Chapter 3 of NUREG 0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants." The NRC conducts inspections to ensure the plant is constructed to appropriate quality standards and in accordance with the design requirements.

NRC regulations also require the periodic inspection, testing, and maintenance of structures, systems, and components that are important to safety in order to ensure that their capabilities to perform their safety functions are adequately maintained. Licensees must continue to satisfy these requirements following issuance of their plant operating licenses.

Nuclear power plants and certain nuclear fuel facilities are also required to develop security plans to thwart potential security threats. These plans must meet requirements in 10 CFR Part 73 and various Commission Orders. The effectiveness of the plans is tested regularly by licensees and by the NRC. The security plans are integrated with other site-specific plans for preparing for and responding to domestic emergencies.

All nuclear power plant licensees have comprehensive emergency preparedness programs (e.g., dedicated emergency response facilities, systems, equipment, and staffing) in place. Detailed site-specific emergency plans and implementing procedures provide instructions and guidelines for dealing with or responding to a variety of emergency situations, including natural phenomena such as hurricanes. These integrated emergency plans are developed in a coordinated manner between the licensee, State and local authorities, with oversight of the NRC and DHS/Federal Emergency Management Agency (FEMA). Emergency response for the sites is evaluated by the NRC every two years, and additional training and drills are conducted between these evaluated exercises to enhance for a wide spectrum of emergencies, including hurricanes. During these exercises, the NRC works closely with the DHS/FEMA in evaluating the acceptability of the emergency plans. The NRC evaluates on-site response capabilities and integration of on-site and off-site preparedness, while DHS/FEMA has the responsibility for evaluating off-site emergency planning, and providing its assessments to the NRC.

As provided in the NRP, terrorism incidents involving nuclear materials licensed by the NRC or an Agreement State<sup>1</sup> are considered Incidents of National Significance. NRC and Agreement State regulations require that users of licensed materials secure and control material and report all instances of loss and/or theft of material, overexposure, release of material to the environment or malfunctions and/or problems with devices/equipment that could jeopardize the public's health and safety. In addition, the NRC has issued additional security measures for the most risk-significant materials to minimize the risk of unauthorized access to those materials.

The Commission also has the authority to modify, suspend, or revoke a license or to take such other action as may be necessary to ensure adequate protection to protect the public health and safety and promote the common defense and security. Thus, the NRC is the federal agency with the authority to shut down nuclear power plants.

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<sup>1</sup>The Atomic Energy Act (AEA) Section 274b permits the NRC to enter into agreements with the governors of states to relinquish its regulatory authority for AEA materials to the State if certain conditions are met. States that meet the conditions and agree to regulate AEA materials are called "Agreement States." Agreement States regulate all sources of radiation in the State, except that the NRC retains authority over production and utilization facilities, such as reactors, fuel fabrication plants and other facilities possessing large quantities of special nuclear material. The NRC also retains authority to regulate AEA materials as necessary to promote the common defense and security. There are currently 33 Agreement States.

**Question 2(b):** To the extent not provided in response to the previous question, please describe any other roles, responsibilities and authorities of the Commission in preparing for and responding to a domestic emergency. With respect to each specific role, responsibility or authority, please identify the component or components within the Commission involved in acting pursuant to that authority or discharging that role and responsibility.

Answer:

The components within the Commission involved in preparing for and responding to a domestic emergency that do not fall under the NRP are the same as those described previously in response to Question 1(b).

The components within the Commission responsible for the additional licensing and inspection functions described in the response to Question 2(a) are as follows:

- Office of Nuclear Reactor Regulation - Responsible for ensuring the public health and safety through licensing and inspection activities at all nuclear power reactor facilities in the United States.
- NRC Regional Offices - Implement the reactor and security inspection programs to ensure compliance with NRC requirements. Implement the licensing and inspection programs for materials and fuel cycle facilities.
- Office of Nuclear Security and Incident Response - Develops overall agency policy and provides management direction for evaluation and assessment of technical issues involving security and response at nuclear facilities. Serves as the agency's emergency preparedness and response interface interface with DHS/FEMA, the intelligence and law enforcement communities, Department of Energy, and other agencies.
- Office of Nuclear Materials Safety and Safeguards - Responsible for ensuring the public health and safety through licensing, inspection, and environmental reviews for all activities regulated by the NRC, except operating power and all non-power reactors and the safeguards technical review of all licensing activities, including export/import of special nuclear material, excluding reactors. Also, directs NRC's contingency planning and emergency response operations dealing with accidents, events, incidents, threats, thefts, and radiological sabotage relating to licensed activities under its responsibility.
- Office of State and Tribal Programs - Responsible for establishing and maintaining effective communications and working relationships between the NRC and States, local government, other Federal agencies and Native American Tribal Governments. The areas of responsibility include reactors, waste, and nuclear materials implemented through the Agreement States Program and the State Liaison Program within the office.



- Responsible for ensuring that the NRC meets its statutory responsibility to keep the appropriate congressional committees fully and currently informed with respect to the agency's activities. Provides advice and assistance to the Chairman, Commission, and NRC staff on all NRC relations with Congress and views of Congress toward NRC policies, plan, and activities; maintains liaison with congressional committees and members of Congress on matters of interest to NRC; serves as primary contact point for all NRC communications with Congress.

**Question 2(c): To the extent not provided in response to the previous question, please describe any other roles, responsibilities and authorities of the Commission in preparing for and responding to a domestic emergency. With respect to each specific role, responsibility or authority, please identify the key personnel involved in acting pursuant to that authority or discharging that role and responsibility.**

Answer:

The components within the Commission involved in preparing for and responding to a domestic emergency that do not fall under the NRP are the same as those described previously in response to Question 1(c).

With regard to the additional licensing and inspection functions described in the response to Question 2(a), those activities are conducted under the cognizance of the respective Office Director or Regional Administrator.

Presently, the key personnel involved in each of the roles are:

- Office of Nuclear Reactor Regulation: James E. Dyer, Director
- NRC Regional Offices:
  - Region I: Samuel J. Collins, Regional Administrator
  - Region II: William D. Travers, Regional Administrator
  - Region III: James L. Caldwell, Regional Administrator
  - Region IV: Bruce S. Mallett, Regional Administrator
- Office of Nuclear Security and Incident Response: Roy P. Zimmerman, Director
- Office of Nuclear Material Safety and Safeguards: Jack R. Strosnider, Director
- Office of State and Tribal Programs: Janet R. Schlueter, Director
- Office of Congressional Affairs: Rebecca L. Schmidt, Director

Further information on the NRC's organization is available on the NRC's public website at <http://www.nrc.gov>.

**Question 3(a): Was the Commission asked to act pursuant to its authorities, play any role, or discharge any of its responsibilities specifically in preparation for or response to Katrina? If so, please provide a detailed description of what the Commission was asked to do, by whom it was asked, when it was asked to do it, what specifically it did and when it did it. Please also include the names and titles of key personnel involved in the request or response.**

Answer:

Yes, the NRC responded to requests from Federal and State agencies. At the Federal level, the NRC coordinated with DHS/FEMA, the Environmental Protection Agency (EPA), the Centers for Disease Control and Prevention (CDC), and the U.S. Army Corp of Engineers (USACE). NRC routinely monitors, prepares for, and responds to every hurricane using established response procedures. Pursuant to its assigned role under the NRP and a Memorandum of Understanding between DHS/FEMA and NRC, NRC routinely coordinates with DHS/FEMA in advance of any hurricane making landfall and potentially impacting an NRC-licensed facility, such as a nuclear power plant. Specific examples include:

- NRC coordinated with FEMA Region VI days before Hurricane Katrina made landfall. FEMA requested to have NRC staff present in the FEMA Region VI Regional Response Coordination Center (RRCC) before the hurricane made landfall. On August 28, 2005, NRC dispatched a Liaison Officer to serve in a communication support position at the FEMA Region VI and continued to staff the position until the hurricane had moved past the nuclear power plants located in Louisiana and Mississippi.
- NRC maintained close contact with DHS and FEMA Region VI staff from August 28, through September 9, 2005, conducting daily teleconferences with Entergy representatives (which operates the Grand Gulf, River Bend Station, and Waterford 3 nuclear plants), DHS/FEMA, and representatives of the Louisiana Department of Environmental Quality (LDEQ). The purpose of these teleconferences was to exchange information concerning the status of the nuclear plants, the status of materials licensed by the State of Louisiana, local infrastructure concerns, and emergency preparedness issues. Participants in the calls also included emergency management representatives from St. John the Baptist and St. Charles Parishes on several occasions.
- In accordance with pre-established plant procedures, the Waterford 3 nuclear power plant began to shut down the day before Hurricane Katrina made landfall. NRC worked closely with DHS/FEMA to review the status of onsite and offsite emergency preparedness issues prior to the restart of Waterford 3, in accordance with the Memorandum of Understanding and NRC procedures. DHS/FEMA and NRC began coordinating efforts to support this review as early as August 30, 2005. At the request of FEMA Region VI, NRC provided two Regional State/Federal Liaison Officers, to serve as a members of the Disaster Initiated Review Team from September 5-8, 2005.

At the State and local emergency response organization level, the NRC coordinated with several Agreement States, which have formal agreements with the NRC for the regulatory authority over sources of radiation within their States, with exception of reactors, large quantities of special nuclear material, and materials licensed to Federal government agencies. Specific examples include:

- Once Hurricane Katrina had passed over the Gulf Coast States, NRC coordinated with Alabama, Florida, Louisiana, and Mississippi to review the status of licensed facilities.
- NRC initiated efforts to coordinate and document information concerning the status of licensed materials located at facilities regulated by these States. These efforts focused on Category I and Category II sources designated in the International Atomic Energy Agency (IAEA) Code of Conduct on the Safety and Security of Radioactive Sources. NRC used an existing database to develop a report summarizing the status of Category I and Category II sources licensed by Louisiana and Mississippi and shared this information with DHS, through the Homeland Security Operations Center (HSOC). Routine updates of the report were transmitted to HSOC from August 31, 2005, through September 20, 2005.
- NRC received requests from the Centers for Disease Control (CDC) through its Emergency Operations Center for briefings on the potential risks associated with sources identified in the reports. On September 9, 11 and 12, 2005, NRC responded to questions from CDC representatives. The U.S. Army Corps of Engineers also participated in the discussion on September 12, 2005.
- NRC responded to a request for updates on Category I and Category II sources from the EPA Region VI office on September 12, 2005. EPA Region VI was assisting the State of Louisiana by providing personnel for field teams dispatched to New Orleans. The Commission and senior management were kept fully informed of the status through daily updates issued by the Executive Director for Operations.
- NRC continued to coordinate with Florida, Alabama, Mississippi, and Louisiana during response and recovery periods. NRC offered the following assistance:
  - On August 31, 2005, LDEQ requested assistance in obtaining security guards for a radioactive source manufacturing facility located near New Orleans. NRC staff coordinated this request with DHS representatives, which led to the dispatch of security resources.
  - On September 2, 2005, LDEQ also requested assistance in obtaining aerial surveys of New Orleans by the Department of Energy's (DOE) Aerial Monitoring System (AMS) to identify any misplaced or stolen radiation sources.
  - On September 2, 2005, the Mississippi Department of Health also submitted a request for assistance in coordinating with DOE to explore options for use of the AMS in the State of Mississippi. NRC assisted the States, through NRC and DOE liaison staff at HSOC, in obtaining the requested assistance.

- On September 8, 2005, DOE began aerial surveys of the New Orleans area once the area was cleared for flights. The surveys were completed on September 14, 2005. Information compiled from the surveys was shared with LDEQ, NRC and DHS as it became available. The Mississippi Department of Health had made substantial progress in confirming the status of sources owned by its licensees located in affected areas of the State and did not require DOE's assistance.
- On September 12, 2005, NRC responded to a request from LDEQ to review drafts of written precautions and information to be provided to emergency workers entering the New Orleans area. The draft described the types of radioactive material that might be encountered by responders, the likely locations of these materials, and the relative hazards associated with the materials. NRC Region IV staff provided comments which were incorporated in the final product.
- LDEQ and NRC Region IV experienced some difficulties in conducting routine communications after Hurricane Katrina made landfall in the New Orleans area due to the loss of the local communications infrastructure. Cellular and satellite telecommunication systems were used, but the infrastructure for these systems was not consistently available. Thus, on September 12, 2005, the Louisiana Radiation Control Program Director accepted NRC's offer of assistance and requested that NRC Region IV dispatch a staff member to the LDEQ office to serve as a liaison for communications between LDEQ and NRC Region IV.
- On September 13, 2005, the NRC dispatched a materials inspector to work closely with the Louisiana Radiation Control Program Director and serve as the primary communicator between LDEQ and NRC Region IV staff. This was a significant relief to the Radiation Control Program Director since he no longer had to make repeated attempts to make contact with NRC over fragile or unavailable communications infrastructure.
- On September 13, 2005, LDEQ also discussed with NRC Region IV staff a potential request for assistance in supporting its field teams that were performing surveys and physical inspections of licensed facilities in New Orleans. The NRC worked with its Federal partners to develop several options, including resources from DOE, EPA, and State organizations as well as private sector resources for the State and provided guidance on how to submit a request for assistance through the DHS HSOC. LDEQ obtained assistance for some of its early field team work from the EPA, which had contractor staff in the area responding to the Hurricane recovery.
- Following the passage of Hurricane Rita, LDEQ requested that NRC Region IV send staff to assist field teams continuing their work in the New Orleans area as well as the areas affected by Hurricane Rita. On September 26, 2005, the NRC Region IV office sent additional staff to Baton Rouge and Lafayette, Louisiana, to provide support that included participation in LDEQ field team inspections. The NRC staff members assisted with inspections through October 5, 2005.

- NRC provided updated information regarding the status of radioactive sources for situation reports (SITREPs) required by DHS and developed the DHS/NRC Joint Bulletin, "Assessment of Security of Radioactive Sources in the Hurricane Affected Area."

The key personnel involved in the requests and responses for Hurricane Katrina were:

#### Executive Team

Nils J. Diaz, Chairman

Luis A. Reyes, Executive Director for Operations (EDO)

William F. Kane, Deputy Executive Director for Reactor  
and Preparedness Programs, Office of Executive Director for Operations (OEDO)

Martin J. Virgilio, Deputy Executive Director for Materials, Research,  
State and Compliance Programs, OEDO

James E. Dyer, Director of the Office of Nuclear Reactor Regulation

Roy P. Zimmerman, Director of the Office of Nuclear Security and Incident Response

Melvyn N. Leach, Director of Incident Response Directorate, Office of Nuclear Security and  
Incident Response

#### Protective Measures Team

The Director was on call and technical support staff were present.

#### Reactor Safety Team

Gary M. Holahan, Associate Director for Risk Assessment and New Projects, Office of  
Nuclear Reactor Regulation.

#### Liaison Team

Eliot B. Brenner, Director of the Office of Public Affairs.

#### Operations Support Team

The Director was on call and support staff were present.

#### NRC Region Operation Centers

Region I: Samuel J. Collins, Regional Administrator

Region II: William D. Travers, Regional Administrator and staff

Region III: James L. Caldwell, Regional Administrator

Region IV: Bruce S. Mallett, Regional Administrator, and  
Thomas P. Gwynn, Deputy Regional Administrator

This is not a complete list of NRC personnel due to the extended timeframe and the extensive involvement of many groups within the agency.

**Question 3(b):** To the extent not included in response to subsection (a), please describe any other action the Commission took pursuant to its authorities, or any other role or responsibilities it assumed specifically in preparation for or response to Katrina. Please be specific as to what the Commission did, when it did it and the names and titles of key personnel involved.

Answer:

Pursuant to its authority, the NRC prepared and responded to Hurricane Katrina from the storm's onset.

The NRC has an established hurricane response program that is implemented each year during hurricane season, from June 1 through November 30. In accordance with NRC response procedures, the NRC's Region II, Region IV, and Headquarters offices began tracking the storm's status from its inception as Tropical Depression 12 on August 24, 2005, when it was located off the coast of Florida.

- The NRC Region II office in Atlanta, Georgia, initially tracked the storm, using National Hurricane Center reports, and issued daily weather updates to alert NRC Headquarters and regional personnel of the storm. The reports were prepared and issued to an internal distribution by staff in the NRC Region II office.
- The NRC Headquarters staff reviewed daily updates received from NRC Region II and conducted daily briefs of Headquarters management to ensure communication of storm status.
- NRC Headquarters ensured the availability of key personnel around the clock to support NRC response activities.
- The NRC Region II office coordinated with the DHS/FEMA Region IV office in Atlanta, Georgia, the State of Florida, and the St. Lucie and Turkey Point nuclear plants prior to the storm becoming a hurricane. These two nuclear power plants had the potential to be affected by the hurricane, but they were never in its direct path.
- The Turkey Point plant in Florida City and the St. Lucie plant on Hutchinson Island implemented their emergency plan procedures to ensure the facilities were fully prepared. The NRC issued various status reports for these plants to keep DHS, the media, and internal stakeholders informed. NRC Region II resident inspectors closely monitored the licensees' preparations prior to landfall of Hurricane Katrina. The hurricane passed between these two plants with little impact except for heavy rain.

When the storm passed west of longitude W87 on August 27, 2005, NRC's Region IV office in Arlington, Texas, assumed primary responsibility for monitoring Hurricane Katrina as it moved into the Gulf of Mexico. Monitoring from the NRC's Region IV office included monitoring storm reports using the National Hurricane Center reports, issuing weather updates to alert NRC Headquarters and regional personnel of the storm status several times daily, and monitoring licensee preparations in advance of landfall.

- The nuclear power plants of interest for NRC Region IV included the Grand Gulf plant in Port Gibson, Mississippi, the River Bend Station in Saint Francisville, Louisiana; and the Waterford 3 plant in Killona, Louisiana.
- The NRC Region IV resident inspectors began closely monitoring licensee preparations at these facilities in advance the hurricane making landfall.
- On August 26, 2005, NRC Region IV prepared staffing plans for resident coverage at these facilities over the weekend period.
- On August 27, 2005, NRC Region IV dispatched a region-based inspector to augment the resident inspector staff at the Waterford 3 nuclear plant. Resident inspectors at the River Bend Station and Grand Gulf nuclear plants were prepared to provide 24-hour coverage beginning August 28, 2005, in accordance with NRC procedures. In accordance with the NRC's incident response program, the Chairman of the NRC and his senior staff led the agency's response to Hurricane Katrina in both Headquarters and NRC Region IV.
- On August 28, 2005, before Hurricane Katrina's arrival along the Gulf Coast States, the NRC entered the Monitoring Mode of its Incident Response Plan. At that time the NRC Headquarters and the Region IV Operations Centers were activated and staffed with appropriate response teams.
- On the evening of August 28, 2005, NRC Region IV also dispatched a State/Federal Liaison Officer to serve in a liaison communication support position at the DHS/FEMA Region VI Regional Response Coordination Center (RRCC). This position was staffed until the hurricane had moved past the nuclear power plants located in Louisiana and Mississippi.
- On August 28, 2005, the Waterford 3 nuclear plant voluntarily shut down in accordance with its plant procedures. The NRC Headquarters staff from the Office of Nuclear Security and Incident Response also made contact with DHS's Chief Nuclear Safety and Chemical Hazards Branch to inform them of the shut down of the Waterford 3 plant. This contact included initial discussions of review efforts that might be needed prior to approval by DHS/FEMA and NRC for restart of the plant, in accordance with a Memorandum of Understanding Between DHS/FEMA and the NRC.
- The NRC remained in the Monitoring Mode at its Operations Centers continuously from August 28, 2005, through the evening of September 6, 2005. During this period, the NRC continued to monitor the impact of the hurricane on the three nuclear plants and facilities licensed by the States of Alabama, Louisiana, and Mississippi, as described above.
- All three nuclear power plants were essentially undamaged by the hurricane. However, land communication lines were lost with the Waterford 3 site because of flooding in the New Orleans area. In addition, offsite power was lost because of instability in the regional electrical grid.

- The NRC Headquarters and Region IV office's worked closely with Entergy, the utility which operates the Grand Gulf, River Bend Station, and Waterford 3 nuclear plants, to identify potential supplemental communications resources. Additional backup satellite communications equipment was deployed to NRC staff at the site, and Entergy employed supplemental land, cellular, and satellite communications to ensure continuous communications with the Waterford 3 site. Following the loss of offsite power, electrical power for key safety systems for the Waterford 3 plant was supplied automatically by the plant standby diesel generators.
- The NRC provided status information on the conditions and the operational status of nuclear power plants and material facilities in the States of Louisiana and Mississippi for DHS and the Federal Joint Field Office, which was established following DHS' declaration of an INS for Hurricane Katrina on August 30, 2005.
- Prior to restart of the Waterford 3 plant, the NRC staff independently verified that key plant systems and structures were able to support safe operations at the plant. The NRC Region IV Regional Administrator established a Waterford 3 Restart Focus Team consisting of Region IV managers and technical staff as well as technical staff from NRC Headquarters. The purpose of this team was to integrate the results of restart readiness inspections, conducted by regional and resident inspectors at Waterford 3, to ensure that a comprehensive, integrated assessment was provided to Regional management regarding restart readiness of Waterford 3 in support of NRC procedures.

This team coordinated with onsite inspectors and met daily from September 6-8, 2005, and coordinated with the Disaster Initiated Review Team led by DHS/FEMA that reviewed offsite emergency preparedness issues.

- The NRC Headquarters and Region IV staff conducted their offsite review activities in accordance with NRC Inspection Manual Chapter 1601, "Communication and Coordination Protocol For Determining The Status Of Offsite Emergency Preparedness Following A Natural Disaster, Malevolent Act, Or Extended Plant Shutdown." At the request of FEMA Region VI, NRC provided two Regional State/Federal Liaison Officers to serve as members of the Disaster Initiated Review team led by FEMA Region VI from September 5-8, 2005.
- On September 9, 2005, NRC received the results of the DHS/FEMA Disaster Initiated Review. Also, that same day, a conference call was conducted between Entergy and NRC officials to discuss Entergy's basis for assurance that Waterford 3 could resume safe operations, including discussion of actions taken to restore offsite electrical power and to address communications issues.
- The NRC and DHS/FEMA assessments concluded that the emergency preparedness infrastructure, both onsite and offsite, was adequate to support plant restart and provide reasonable assurance that protective measures could be taken to protect public health and safety in the event of a radiological emergency.



- On September 9, 2005, based on discussions with Entergy and the satisfactory onsite and offsite reviews noted above, NRC granted authorization for Entergy to resume operation of the Waterford 3 plant. This authorization was documented in a letter from the NRC Region IV Regional Administrator to the Vice President, Operations for Waterford 3.

**Question (3c):** To the extent not included in response to subsections (a) and (b), please describe any other actions the Commission considered taking or offered to take pursuant to its authorities, or any other role or responsibilities it considered assuming or offered to assume specifically in preparation for or response to Katrina. Please be specific as to what the Commission considered or offered, when it considered or offered it, why such actions weren't taken or such roles or responsibilities weren't assumed, and the names and titles of key personnel involved.

Answer:

With regard to the Waterford 3 nuclear power plant, the NRC's Office of Nuclear Reactor Regulation and Region IV staff anticipated that the licensee might request relief from certain regulatory requirements to enable restart of the reactor. The NRC evaluated the need for license amendments, Code relief, or other potential relief from regulatory requirements. This evaluation, which included discussions with the licensee, determined that there were no emergency Technical Specification amendments (part of the facility's license) or American Society of Mechanical Engineers (ASME) Code relief requests needed by the licensee to support plant restart.

**Question (3d):** Please describe each instance, if any, in which Commission action was in any way hindered, delayed, limited or not taken because of concern over whether the Commission had authority to take the action. Indicate key personnel involved and how the issue was resolved.

Answer:

There were no instances in which Commission action was in any way hindered, delayed, limited or not taken because of concern over whether the Commission had authority to take the action.

**Question (3e):** Please describe each instance, if any, in which Commission action was in any way hindered, delayed, limited or not taken because of concern over reimbursement. Indicate key personnel involved and how the issue was resolved.

Answer:

There were no Commission actions that were in any way hindered, delayed, limited or not taken because of concern over reimbursement.

**Question 4: Please state the time and date the Commission was first informed that the National Response Plan was being activated in response to Hurricane Katrina. Identify who informed the Commission, who received the information and what specific information was conveyed.**

Answer:

The NRC Headquarters and Region IV staff learned of the activation of the National Response Plan through several means. Applicable Emergency Support Function Annexes to the National Response Plan were initially activated on August 25, 2005, as noted in the DHS Situation Reports (refer to response to Question # 5 below). This was also confirmed by conversations between FEMA Region VI staff and NRC Region IV staff on August 28, 2005. The Secretary of Homeland Security declared Hurricane Katrina to be an INS on August 30, 2005, and, as provided in the National Response Plan, this declaration formally activated the overall Plan. The NRC learned of the Declaration of the INS via monitoring of national media coverage and DHS's press conferences of the hurricane on August 30, 2005. A DHS Situation Report dated August 31, 2005, contained this information, which was posted on DHS's website and monitored by NRC staff.

Specific information conveyed by DHS can be found in Situation Report Nos. 1 and 11 dated August 25, and August 31, respectively.

As noted in the response to Question 3, the NRC tracked the hurricane's status carefully since inception as Tropical Depression 12 and implemented its emergency response procedures on August 24, 2005.

**Question 5: Please state the time and date the Commission was first informed that any annex to the National Response Plan was being activated in response to Hurricane Katrina. Identify who informed the Commission, who received the information and what specific information was conveyed.**

Answer:

FEMA, as part of its standard hurricane preparations protocols, activates selected Emergency Support Function Annexes to the National Response Plan in advance of hurricane landfall. For Katrina, FEMA initially activated several ESFs on August 25, 2005, and notified Federal departments/agencies of this activation by e-mail dated August 25, 2005. The NRC incident response organization was a recipient of this communication.

Specific information conveyed by DHS can be found in Situation Report Nos. 1 and 11 dated August 25, and August 31, respectively.

STATEMENT SUBMITTED  
BY THE  
UNITED STATES NUCLEAR REGULATORY COMMISSION

TO THE  
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS  
UNITED STATES SENATE

FOR THE  
HURRICANE KATRINA HEARING

PRESENTED BY  
DR. NILS J. DIAZ  
CHAIRMAN

**Introduction**

Mr. Chairman and members of the Subcommittee, it is a privilege to appear before you today to discuss the U.S. Nuclear Regulatory Commission's preparations and response to Hurricane Katrina. To summarize NRC's actions, I have attached a factual NRC timeline for the Hurricane Katrina activities.

**Overview of Nuclear Emergency Preparedness and Response**

The NRC's mission is to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment at nuclear power plants and materials facilities – during routine operations and during abnormal or emergency conditions, including natural emergencies, such as Hurricane Katrina. The NRC takes an integrated approach to safety, security, and emergency preparedness in carrying out this mission. This approach, combined with the defense-in-depth strategy we use for licensing the design, construction, and operation of nuclear power plants, provides substantial protection against severe natural phenomena, such as hurricanes and tornados.

The well-established capabilities and procedures of the NRC, our Federal and Agreement States partners, and our licensees proved to be effective during Hurricane Katrina for NRC areas of responsibility. The nuclear power plants affected by this hurricane were essentially undamaged. Concurrently with the disciplined approach to preparation by our nuclear reactor licensees, the NRC initiated pertinent command and control of emergency response activities early and activated the NRC Region IV Operations Center in Arlington, Texas, and the NRC Headquarters Operations Center in Rockville, Maryland, as the hurricane approached the Gulf Coast, with substantial participation from all regions and senior management, including the

Chairman. My fellow commissioners were kept fully and currently informed. In addition, the NRC and State regulatory agencies initiated and implemented emergency preparedness and response activities to account for, and ensure the safety and security of radioactive materials located in the States of Louisiana, Alabama, and Mississippi. These States are Agreement States, through formal agreements with the NRC, have regulatory authority over certain sources of radioactive materials within their States. This authority does not include reactors, large quantities of special nuclear material, or materials licensed to Federal government agencies. The NRC coordinated extensively with the Agreement States and our Federal licensees to ensure that the safety and security of radioactive sources were maintained.

For nuclear power plants, emergency planning begins with robust facility designs. NRC regulations require each nuclear power plant to be designed and constructed to withstand the effects of severe natural phenomena pertinent to the surrounding area, along with added margins of safety for even more extreme postulated events. The design of these facilities considers the combination of the effects of natural phenomena with the effects of normal and accident conditions at the plant. For example, nuclear power plants in Florida and along the Gulf Coast are designed with capabilities to mitigate plant accidents even with the effects of hurricanes, flooding, and loss of offsite power from the electrical grid, while nuclear power plants in California include capabilities to mitigate plant accidents even with the effects of a severe earthquake and loss of off-site power from the electrical grid. Waterford 3, the nuclear power plant closest to New Orleans, is equipped with protective features against flooding, including a thirty-foot levee and water-tight compartment doors for safety-related equipment.

Over the years, U.S. nuclear power plants have experienced direct impacts of severe

natural phenomena, and their robust design and construction have enabled them to successfully withstand such events. Some of the events experienced within the past 15 years include: Hurricane Andrew, a Category 4 hurricane, which passed directly over the Turkey Point nuclear power plant with sustained wind speeds of 145 miles per hour and gusts up to 175 miles per hour (August 1992); the Cooper Nuclear Station, which experienced flooding onsite from the Missouri River (July 1993); a Fujita Tornado Damage Scale F2 tornado, which directly hit the Davis Besse Nuclear Power Station, with winds of 113 to 157 miles per hour (June 1998); and, the Diablo Canyon Power Plant, which felt the shock from a Magnitude 6.5 San Simeon earthquake in Paso Robles, California (December 2003). In all these cases, the nuclear power plant functioned as they were designed, and adequate protection was maintained during and after the event.

NRC regulations also require all nuclear power plant licensees to have in place comprehensive emergency preparedness programs (e.g., dedicated emergency response facilities, systems, equipment, and staffing). Detailed site-specific emergency plans and implementing procedures provide instructions and guidelines for dealing with or responding to a variety of emergency situations, including natural phenomena such as hurricanes. These integrated emergency plans are developed in a coordinated manner between the facility licensee and State and local authorities, with oversight of the NRC and the Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA). Emergency response for the sites is periodically evaluated by the NRC, and additional training and drills are conducted between these evaluated exercises to help further prepare for a wide spectrum of emergencies, including hurricanes. During these exercises, the NRC works closely with DHS/FEMA in evaluating the

acceptability of the emergency plans. The NRC evaluates onsite response capabilities and integration of onsite and offsite preparedness, and then reviews the findings that DHS/FEMA makes regarding offsite emergency planning.

The NRC has exercised its key responsibilities in coordination with DHS and other Federal agencies under the National Response Plan (NRP). In accordance with the NRP, the NRC is the coordinating agency for incidents involving facilities and/or materials licensed by the NRC or an Agreement State. Accordingly, the NRC leads the Federal-level response functions identified in the Nuclear/Radiological Incident Annex with support provided by the cooperating agencies, such as the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA). In cooperation with its Federal partners, the NRC implemented the NRP for Hurricane Katrina.

### **NRC Incident Response Program**

The NRC Operations Center, located at its Headquarters Office in Rockville, Maryland, is continually staffed with qualified personnel, who have the expertise and ability to evaluate events and alert NRC management, other Federal partners, and licensees, as necessary, to properly respond to unfolding events. Over the years, the NRC has taken several steps to enhance its emergency preparedness and response capabilities. These include increased staffing and modernization of facilities and equipment, more frequent exercises with other Federal agencies, and increased interaction with our international partners to gain knowledge of incident response activities in other countries. The NRC is also playing an active role in enhancing incident response capabilities for radiological emergencies and incidents by conducting tabletop exercises

with Federal and State emergency response organizations and outreach activities with local stakeholders. During preparation and response to emergencies, the agency also discharges its responsibility to communicate developments to Congressional delegations and State executives, as appropriate.



The NRC is capable of responding to multiple events, affecting multiple plants at the same time. This was demonstrated when the NRC was responding effectively to Hurricane Katrina while simultaneously participating in a biennial emergency exercise at the Monticello Nuclear Plant in Minnesota on August 30, 2005. The NRC also responded successfully to multiple events during the August 2003 electrical grid collapse in the northeast and Midwest, which resulted in automatic reactor shutdowns at nine U.S. nuclear power plants and the loss of offsite power at eight plants.

### **Preparedness for Hurricane Season**

The NRC and its licensees routinely monitor, prepare for, and respond to hurricanes using well-established procedures. The NRC requires that each nuclear power plant shut down under weather conditions specific to each site. For example, the Waterford 3 plant began to shut down the day before Hurricane Katrina made landfall in Louisiana, based on projected sustained wind speeds exceeding 74 miles per hour.

The NRC has an established hurricane response program that is implemented each year during hurricane season, from June 1 through November 30. The NRC has responded to hurricanes with nuclear power plants in their direct paths. Throughout the hurricane season, the NRC monitors potentially hazardous weather conditions in the Atlantic and Pacific Oceans, the Caribbean Sea, and the Gulf of Mexico. For the Atlantic basin, the NRC monitors tropical storm formations developing as far away as the African coast. The NRC relies on hurricane tracking computer programs and data provided by the National Oceanic and Atmospheric Administration that provides current and projected information about developing storms and their proximity to the U.S. coastline.



At the beginning of each hurricane season, nuclear power plant licensees prepare well in advance by updating procedures and assessing their sites for readiness. For an approaching hurricane, a licensee's response would typically include identification of emergency staffing, plans for activation of emergency support facilities, testing of routine and emergency communications, equipment readiness checks, and updating of contact information with Federal, State, and local agencies.

### **Response to Hurricane Katrina**

For Hurricane Katrina, the NRC and its licensees took aggressive and prudent steps to prepare for its impact. The NRC and nuclear power plant licensees began preparations before Katrina first made landfall in Florida on August 25, 2005. The NRC tracked the hurricane's status carefully from its inception as Tropical Depression 12 on August 24, 2005, when it was located well off the coast of Florida. The NRC's Region II office in Atlanta, Georgia, initially tracked the storm and issued daily weather updates to alert the Commission, NRC Headquarters, and regional personnel of this storm. The NRC Region II office coordinated with DHS/FEMA's Atlanta regional office, the State of Florida, and NRC licensees prior to the storm becoming a hurricane, and maintained communications throughout the passage of the hurricane over Florida.

Two nuclear power plants in Florida had the potential to be affected by the hurricane, but were never in its direct path. The Turkey Point plant in Florida City and the Saint Lucie plant on Hutchinson Island implemented emergency preparations to ensure the facilities were fully prepared. The NRC issued status reports for these plants to keep stakeholders informed and NRC's site resident inspectors monitored site conditions and implementation of the licensee's established procedures for hurricane preparations.



When the storm passed west of longitude W87 on August 27, 2005, NRC's Region IV office in Arlington, Texas, monitored Hurricane Katrina as it moved into the Gulf of Mexico. The NRC Region IV Operations Center coordinated with Louisiana and Mississippi State officials and, on August 28, 2005, an NRC State/Federal Liaison Officer was dispatched to FEMA's regional office in Denton, Texas. In accordance with the NRC's incident response program, the Chairman of the NRC and NRC senior staff led the agency's response to Hurricane Katrina in both Headquarters and Region IV. Before Hurricane Katrina's arrival along the Gulf Coast States, the NRC staffed its Headquarters and Region IV Operations Centers with experts to prepare for any unforeseen circumstances, and NRC Region IV dispatched additional inspection staff to augment the permanently assigned resident inspectors at nuclear power plants in Louisiana and Mississippi.

The Grand Gulf plant in Port Gibson, Mississippi, the River Bend plant in Saint Francisville, Louisiana, and the Waterford 3 plant were more impacted by Hurricane Katrina than the plants located in Florida. Before, during, and after the storm's passage, the NRC closely monitored onsite and offsite activities at each of these sites by maintaining staff in NRC's Headquarters and Region IV Operations Centers and at the sites. The NRC held routine conference calls with the State of Louisiana and the parishes surrounding the Waterford 3 site and supported the State of Louisiana's Emergency Operations Center in Baton Rouge. The NRC provided status information on the conditions and the operational status of nuclear power plants and materials facilities in the States of Louisiana and Mississippi for the Federal Joint Field Office, which was established following DHS' declaration of an incident of national significance for Hurricane Katrina on August 30, 2005.



All three nuclear power plants were essentially undamaged by the hurricane. However, land-line communications with the Waterford 3 site were lost because of flooding in the New Orleans area. In addition, offsite power was lost because of instability in the regional electrical grid. Following the loss of offsite power, electrical power for key safety systems for the Waterford 3 plant was supplied automatically by the plant's standby diesel generators. To address the loss of land-line communication, extra land lines were installed and satellite communications equipment was employed for communication following the hurricane's passage at this site. Backup satellite communications equipment was employed by NRC staff at the site, NRC Region IV, and NRC Headquarters to ensure continuous communications with the Waterford 3 site.

Prior to restart of the Waterford 3 plant, the NRC staff independently verified that key plant systems and structures were able to support safe operations at the plant, and in cooperation with DHS/FEMA, the NRC confirmed that the offsite infrastructure was adequate to support plant operations. An NRC regional team evaluated onsite emergency preparedness and the readiness of the plant for restart. Also, the NRC participated in the DHS/FEMA Disaster Initiated Review Team for the offsite assessment of the Waterford 3 site by reviewing and evaluating offsite emergency preparedness and response capabilities. After successful completion of these evaluations, the Waterford 3 power plant resumed operation, supplying electricity to support recovery of the regional infrastructure.

#### **NRC Response for Radioactive Material Control**

NRC and the Agreement States of Alabama, Louisiana, and Mississippi share the regulatory oversight responsibilities for ensuring the safety and security of radioactive materials

in the region affected by Katrina. These Agreement States have regulatory authority over approximately 98 percent of the total number of radioactive materials licensees located within their borders. The NRC has jurisdiction for the remainder, which includes Federal facilities such as Veterans Hospitals and the U.S. military.

The majority of the NRC and Agreement State licensed material is in the form of sealed sources. Devices containing sources of the greatest concern from a radiological standpoint are designated as Category 1 or 2 in the International Atomic Energy Agency (IAEA) Code of Conduct on the Safety and Security of Radioactive Sources and are designed and manufactured in accordance with strict NRC regulatory requirements. To ensure that the source is designed to meet or exceed standards as specified in the regulatory requirements, the NRC or its equivalent Agreement States must review the manufacturers' application to produce a sealed source. Typically, these sources are doubly encapsulated in stainless steel and are manufactured to withstand accidental conditions such as immersion, fire, and drop/crushing. When not in use, the sources are stored in a shielded configuration to ensure the safety of the general public, as well as workers.

The NRC worked closely with its Agreement State partners and its own materials licensees (Federal facilities) in those States to monitor the safety and security of radioactive sources of concern during the recovery from Hurricane Katrina. The NRC contacted its IAEA Category 1 and Category 2 licensees (Federal facilities) in the affected States to obtain additional information on the status and security of facilities and materials listed in an existing database. This database list included information on facilities regulated by the NRC, Louisiana, Alabama, and Mississippi, which was updated daily. Coordination with the Agreement States proved



successful in obtaining current information regarding the control and status of radioactive materials. The NRC, through its Agreement State liaisons, was able to verify the control and status of all IAEA Category 1 and Category 2 sources located in Alabama and Mississippi within days of Katrina's landfall. The NRC continues to coordinate with Louisiana to confirm the continued control of radioactive sources and licensed facilities in locations with limited access.

The NRC also discussed the availability of resources for assisting in recovery efforts with its Federal partners, including the Center for Disease Control, DOE, EPA, FEMA, and the U.S. Army Corp. of Engineers. The NRC also assisted Louisiana with its request for use of the DOE's Aerial Monitoring System to detect any misplaced or missing radiation sources. On September 13, 2005, the NRC sent staff to the Louisiana Department of Environmental Quality (LDEQ) for an extended period to enhance communications and provide assistance at facilities that contained IAEA Category 1 and 2 sources in Louisiana. On September 26, 2005, the NRC sent additional staff to Baton Rouge and Lafayette, Louisiana, to provide support that includes participation in LDEQ field teams.

In addition, the NRC provided current information regarding the status of radioactive sources for situation reports (SITREPs) required by DHS, and developed the DHS/NRC Joint Bulletin, "Assessment of Security of Radioactive Sources in the Hurricane Affected Area." The NRC remains ready to provide staff with technical expertise concerning radioactive materials safety and control to DOE, EPA, FEMA, and State radiological emergency response teams.

### **Conclusion**

For more than 25 years, the NRC has implemented improvements in its emergency

preparedness and incident response programs, and continues today to be vigilant in ensuring the adequate protection of public health and safety, common defense and security, and the environment before, during, and after natural or man-made emergencies. During this time, the combination of robust nuclear power plant design and construction, comprehensive emergency preparedness programs and implementing procedures which improved significantly after September 11, 2001, and well-trained staff has proven effective against severe natural phenomena. As the response to Hurricane Katrina demonstrates, NRC and its licensees' emergency preparedness capabilities and established procedures have proven to be effective in responding to events at licensee facilities, including natural phenomena. We are committed to continuous assessment and enhancement of these capabilities. As it has done routinely following previous hurricanes, the NRC is conducting a lessons learned from Hurricane Katrina. The NRC has already applied insights from the experience with Hurricane Katrina in preparing for and responding to Hurricanes Rita and Wilma and will further enhance coordination with DHS/FEMA to ensure effective emergency preparedness and timely return to service of nuclear power plants. The NRC will continue to exercise strong oversight of each facility it licenses and work closely with Federal, State, and local agencies to protect the public.

I appreciate the opportunity to appear before you today, and I welcome your comments and questions.

**NRC Preparations and Response to Hurricane Katrina**

**August 24, 2005 - (Five days before landfall in Louisiana)**

- NRC's Headquarters Operation Center (HOC) in Rockville, Maryland and Region II office in Atlanta, Georgia, begin to track Tropical Depression 12 as it formed 270 miles ESE of the SE coast of Florida.
- NRC Region II began implementation of NRC Procedure #2651 for Hurricane Response.
- NRC Region II issued a Tropical Weather Update to NRC Headquarters and NRC Regions.
- NRC Region II coordinated with the Department of Homeland Security (DHS)/Federal Emergency Management Agency's (FEMA) Region IV office in Atlanta, Georgia, the State of Florida, and applicable NRC licensees.
- NRC issued status reports for the two power plants in Florida, the Turkey Point plant in Florida City and the Saint Lucie plant on Hutchinson Island, that had the potential to be affected by the hurricane. These status reports kept stakeholders informed about the preparations that the power plant licensees were taking in response to the approaching storm.

- NRC's site resident inspectors at the Turkey Point and Saint Lucie plants examined site conditions and monitored the licensees' implementation of their established procedures for hurricane preparations.
- NRC Headquarters received a "Notification Of an Unusual Event" declaration from the Turkey Point and Saint Lucie power plant licensees. This is the lowest level of emergency classification for events at nuclear power plants. The licensees made the declarations in response to the issuance of the hurricane warning for Tropical Depression 12. NRC notified other Federal agencies of the declaration, consistent with established procedures.

**August 25, 2005 - (Four days before landfall in Louisiana)**

- NRC Region II issued a Tropical Weather Update on Tropical Storm Katrina.
- As it approached the east coast of Florida, the storm strengthened to a Category 1 hurricane and, as predicted by the hurricane tracking software utilized by the NRC, it passed between the Turkey Point and Saint Lucie power plants. There were no impacts to either power plant except heavy rain.
- NRC Region II was in communication with the Turkey Point and Saint Lucie power plants prior to the storm becoming a hurricane and during the hurricane's passage.



**August 26, 2005 - (Three days before landfall in Louisiana)**

- NRC Region II issued a Tropical Weather Update on Hurricane Katrina.
- NRC resident inspectors at the Grand Gulf power plant in Port Gibson, Mississippi, the River Bend power plant in Saint Francisville, Louisiana, and the Waterford 3 power plant in Killona, Louisiana, began to closely monitor licensee preparations for the approaching hurricane.
- NRC Region IV in Arlington, Texas, prepared staffing plans for onsite resident inspector coverage at the Grand Gulf, River Bend, and Waterford 3 power plants during the weekend.

**August 27, 2005 - (Two days before landfall in Louisiana)**

- As Hurricane Katrina passed west of longitude W87, NRC Region II transferred the tracking of the hurricane to NRC Region IV, in accordance with established hurricane tracking procedures. NRC Region IV implemented NRC Procedure #2651 for Hurricane Tracking.
- NRC Region IV dispatched a region-based inspector to augment the resident inspector staff at the Waterford 3 power plant. Resident inspectors at the Grand Gulf, River Bend, and Waterford 3 power plants were prepared to provide 24-hour coverage

beginning August 28, 2005, in accordance with NRC procedures.

- NRC Headquarters received a “Notification Of an Unusual Event” declaration from the Waterford 3 power plant due to the issuance of a hurricane warning. NRC then notified the Department of Agriculture, Department of Energy, Department of Health and Human Services, DHS/FEMA, and the Environmental Protection Agency, consistent with established procedures.

**August 28, 2005 - (Day before landfall in Louisiana)**

- NRC Headquarters made numerous phone calls in the morning to update NRC Regions on the hurricane preparations being performed at the Grand Gulf, River Bend, and Waterford 3 power plants.
- The NRC Chairman participated in multiple Executive Team briefings with senior Headquarters and NRC Region IV management on Hurricane Katrina preparations.
- In accordance with plant procedures, the Waterford 3 power plant shut down as a precautionary measure, based on projected wind speeds exceeding 74 miles per hour.
- At 1600 EST, the NRC entered Monitoring Mode. NRC RIV activated and fully staffed its Incident Response Center. The NRC HOC and NRC Region IV continued to closely monitor the onsite and offsite activities at power plants located along the

Gulf Coast.

- NRC Region IV dispatched a NRC State/Federal Liaison Officer to FEMA's Region VI Office in Denton, Texas.
- NRC initiated routine conference calls with the State of Louisiana and the parishes surrounding the Waterford 3 site, and offered support to the State of Louisiana's Emergency Operations center in Baton Rouge.
- NRC Region IV contacted and offered assistance to the Louisiana Department of Environmental Quality (LDEQ) and made arrangements for further contacts with them after the hurricane passed. NRC management was briefed on NRC and Agreement State materials licenses in Louisiana.
- NRC issued a press release on Hurricane Katrina preparations.

**August 29, 2005 - (Landfall of Hurricane Katrina)**

- Before Hurricane Katrina made landfall, NRC staffed the Homeland Security Operations Center (HSOC), and NRC HOC and NRC RIV began receiving information from the Grand Gulf, River Bend, and Waterford 3 power plants' Emergency Response Data System, which provides plant status and weather



information directly to NRC.

- The NRC Chairman participated in multiple Executive Team briefings on the status of Hurricane Katrina and NRC licensee activities.
- NRC HOC and NRC Region IV continued routine communications with the Waterford 3, River Bend, and Grand Gulf power plants throughout the hurricane's passage. NRC HOC was fully staffed with four teams of specialists. Members became familiar with the Waterford 3 plant's flooding and wind design bases.
- NRC Region IV began daily contacts with the States of Mississippi and Louisiana to receive status reports and to offer assistance with regard to materials licensees.

**August 30, 2005 - (Day after landfall in Louisiana)**

- NRC HOC staff exercised responding to multiple events. NRC HQ management held periodic briefings on the status of Hurricane Katrina during the emergency preparedness exercise with the Monticello Nuclear Station.
- NRC Headquarters and NRC Region IV worked closely with the licensee that operates the Grand Gulf, River Bend, and Waterford 3 nuclear plants to identify potential supplemental communications resources. Satellite communications were used to continue communications with the Waterford 3 plant following loss of phone

capability due to local flooding.

- NRC issued a press release on Hurricane Katrina monitoring activities.

**August 31, 2005 - (Two days after landfall in Louisiana)**

- As part of NRC Headquarters and NRC Region IV coordination efforts with Agreement States and the Federal government on the security and status of radioactive materials in the Gulf Coast area, NRC Headquarters coordinated with DHS on a request by the LDEQ for assistance in obtaining security guards for a radioactive source manufacturing facility located near New Orleans.
- NRC used an existing database to develop a report summarizing the status of Category 1 and Category 2 sources licensed by NRC, Alabama, Louisiana, and Mississippi and shared this information with DHS through the HSOC. Routine updates of the report were transmitted to HSOC from August 31, 2005, through September 20, 2005.

**September 2, 2005 - (Four days after landfall in Louisiana)**

- NRC Headquarters and NRC Region IV assisted LDEQ with a request to obtain

surveys of New Orleans by using DOE's Aerial Monitoring System to detect any misplaced or stolen radiation sources.

- NRC Headquarters and NRC Region IV coordinated with a DOE liaison at HSOC to assist the Mississippi Department of Health in evaluating the use of DOE's Aerial Monitoring System to detect misplaced or stolen radiation sources in Mississippi.

**September 5-8, 2005 - (Week after landfall in Louisiana)**

- At the request of DHS/FEMA Region VI, NRC provided two Regional State/Federal Liaison Officers to serve as members of the Disaster Initiated Review Team for the offsite assessment of the Waterford 3 site to confirm that the offsite infrastructure was adequate to support plant operations.
- On September 6, 2005, NRC returned to Normal Mode and NRC Region IV shut down its Incident Response Center.
- NRC participated in DHS/FEMA's assessment of offsite emergency preparedness and response capabilities for the Waterford 3 plant. Prior to restart of the Waterford 3 plant, the NRC staff independently verified that key plant systems and structures were able to support safe operations at the plant.
- On September 8, 2005, NRC issued a press release on NRC's oversight of the

Waterford 3 restart activities.

**September 9-13, 2005 - (Second week after landfall in Louisiana)**

- On September 9, 2005, NRC Headquarters notified the licensee of the Waterford 3 power plant (by phone and followed up by letter) that the NRC concurred with the assessment that the emergency preparedness infrastructure, both onsite and offsite, was adequate for the restart of the plant.
- On September 9, 2005, NRC issued a press release on the restart of Waterford 3.
- The NRC assisted Centers for Disease Control and Environmental Protection Agency representatives on the status of Category 1 and 2 sources licensed by Louisiana and Mississippi. Devices containing sources designated as Category 1 or 2 in the International Atomic Energy Agency Code of Conduct on the Safety and Security of Radioactive Sources are designed and manufactured in accordance with strict regulatory requirements.
- NRC assisted the LDEQ with preparation of written precautions and information for emergency workers entering the New Orleans area.
- On September 13, 2005, NRC dispatched a materials inspector to the LDEQ. The NRC inspector worked closely with the Louisiana Radiation Control Program Director and served as the primary communicator between LDEQ and the NRC Region IV.

**September 26 - October 5, 2005 - (Fourth and fifth weeks after landfall in Louisiana)**

- NRC sent additional staff to Baton Rouge and Lafayette, Louisiana, to provide support that included participation in LDEQ field teams. NRC assisted with inspections and communications through October 5, 2005.