

**Report to the Governor:
Final Recommendations of the Nuclear Review Task Force**

January 31, 2012



Nuclear Review Task Force
NJDEP Commissioner Bob Martin, Chairman

Nuclear Review Task Force

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TABLE OF CONTENTS

INTRODUCTION..... 4

NUCLEAR REGULATORY COMMISSION ACTIONS..... 6

NEW JERSEY TASK FORCE RECOMMENDATIONS..... 10

FINAL SUMMARY 16

INTRODUCTION

This is the final report of the Nuclear Review Task Force created on March 25, 2011 to conduct a thorough assessment of operations and emergency preparedness plans for the State's four nuclear generating facilities: Oyster Creek in Lacey Township, Hope Creek in Lower Alloways Creek Township, and the Salem Units One and Two reactors, also in Lower Alloways Creek Township. The Task Force consisted of the following members: department of Environmental Protection (NJDEP) Commissioner Bob Martin, Office of Homeland Security and Preparedness (NJOHSP) Director Charles B. McKenna, Office of Emergency Management (NJOEM), State Police Superintendent Col. Rick Fuentes, and Board of Public Utilities (NJBPU) President Lee Solomon. The Task Force members focused on any early lessons from the nuclear emergency that occurred in Japan in the wake of an earthquake and tsunami on March 11, 2011, with the goal of implementing lessons learned from that incident that might enhance New Jersey's current comprehensive nuclear response protocols. Of particular focus for the Task Force were the State's emergency communications, power supply, spent fuel storage, emergency response protocols, and radius of the evacuation zone.

The Task Force began its analysis of New Jersey's nuclear facilities at its first meeting on March 29, 2011. Members of the Task Force also testified on April 6 before the Telecommunications and Utilities, Environment and Solid Waste, and Homeland Security and State Preparedness Committees of the State Assembly, informing the Legislature of the roles carried out by various State agencies to prepare the State in the event of a nuclear emergency. In addition to speaking with the Legislature about the State's nuclear preparedness, the Task Force held numerous discussions with PSEG and Exelon, which own and operate the nuclear reactors in New Jersey (which the Task Force visited), and with the Regional Administrator for the Nuclear Regulatory Commission (NRC). The Task Force's observations and recommendations were informed by the opportunities presented through those exchanges.

The Task Force completed its interim report on June 27, 2011 and met again with the NRC and industry representatives to discuss the Initial Observations and Recommendations in that report. On July 12, 2011, the NRC's Near-Term Task Force (NTTF) provided its recommendations to the Commission (SECY-11-0093, "Near-Term Report and Recommendations for Agency Action Following the Events in Japan"). On August 19, 2011, the Commission directed NRC staff to make recommendations regarding the NTTF recommendations by September 9, 2011. Section two of this report includes the NTTF's July 12, 2011 recommendations and the Staff's September 9, 2011 recommendations.

As the events of the Japanese nuclear disaster were unfolding, there was some speculation that a release of offsite radiation had occurred and that the release was the result of compromises in the spent fuel pools and possibly the fuel stored in dry casks. However, in a December 16, 2011 letter to the Mayor of San Clemente, California, the NRC stated that the information obtained to date indicates that no offsite radioactive release occurred from spent fuel stored in the pools or dry casks at Fukushima Dai-ichi.

In that letter, NRC Executive Director for Operations, R.W. Borchardt further stated that the NRC believes that spent fuel pools and dry casks both provide adequate protection of public health and safety and the environment.

This final report represents the culmination of the Task Force's conclusions based upon the lessons learned to date. Each agency in the Task Force will continue to monitor ongoing information made available from Japan and maintain an open dialogue with the other members for the purposes of assessing future actions by the Task Force.

NUCLEAR REGULATORY COMMISSION ACTIONS

NTTF Recommendation 2.1

Order licensees to reevaluate the seismic and flooding hazards at their sites against current NRC requirements and guidance, and if necessary, update the design basis and structures, systems, and components important to safety to protect against the updated hazards.

NRC Staff Recommendations

1. Continue stakeholder interactions to discuss the technical basis and acceptance criteria for conducting a reevaluation of site-specific seismic hazards.
2. Initiate stakeholder interaction to discuss application of the present-day regulatory guidance and methodologies being used for early site permit and combined license reviews to the reevaluation of flooding hazards at operating reactors.
3. Develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to (1) reevaluate site-specific seismic hazards using the methodology in item 1 above, and (2) identify actions that have been taken or are planned to address plant-specific vulnerabilities associated with the updated seismic hazards.
4. Develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to (1) reevaluate site-specific flooding hazards using the methodology discussed in item 2 above, and (2) identify actions that have been taken or are planned to address plant-specific vulnerabilities associated with the updated flooding hazards.
5. Evaluate licensee responses and take appropriate regulatory action to resolve vulnerabilities associated with updated specific hazards.

NTTF Recommendation 2.3

Order licensees to perform seismic and flood protection walkdowns (inspections) to identify and address plant-specific vulnerabilities and verify the adequacy of monitoring and maintenance for protection features such as watertight barriers and seals in the interim period until longer-term actions are completed to update the design basis for external events.

NRC Staff Recommendations

Develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to (1) develop a methodology and acceptance criteria for seismic and flooding walkdowns to be endorsed by the staff following interaction with external stakeholders, (2) perform seismic and flood protection walkdowns to identify and address plant-specific vulnerabilities (through corrective action program) and verify the adequacy of monitoring and maintenance for protection features, and (3) inform the NRC of the results of the walkdowns and corrective actions taken or planned.

NTTF Recommendation 4.1

Initiate rulemaking to revise 10 CFR 50.63 to require each operating and new reactor licensee to: (1) establish a minimum coping time of 8 hours for a loss of all AC (alternating current) power, (2) establish the equipment, procedures, and training necessary to implement an “extended loss of all AC” coping time of 72 hours for core and spent fuel pool cooling and for reactor coolant system and primary containment integrity as needed, and (3) preplan and prestage offsite resources to support uninterrupted core and spent fuel pool cooling, and reactor coolant system and containment integrity as needed, including the ability to deliver the equipment to the site in the time period allowed for extended coping, under conditions involving significant degradation of offsite transportation infrastructure associated with significant natural disasters.

NRC Staff Recommendation

Engage stakeholders in support of rulemaking activities to enhance the capability to maintain safety through a prolonged station blackout. These activities will include the development of the regulatory basis, a proposed rule, and implementing guidance.

NTTF Recommendation 4.2

Order licensees to provide reasonable protection for equipment currently provided pursuant to 10 CFR 50.54(hh)(2) from the effects of design-basis external events and to add equipment as needed to address multi-unit events while other requirements are being revised and implemented.

NRC Staff Recommendations

Develop and issue Orders to licensees to provide reasonable protection of the equipment to satisfy the requirements of 10 CFR 50.54(hh)(2) from the effects of external events, and to establish and maintain sufficient capacity to mitigate multi-unit events.

NTTF Recommendation 5.1

Order licensees to include a reliable hardened vent in BWR Mark I and Mark II containments. This order should include performance objectives for the design of hardened vents to ensure reliable operation and ease of use (both opening and closing) during a prolonged station blackout.

NRC Staff Recommendation

Develop and issue Orders to licensees with BWR Mark I primary containment designs to take action to ensure reliable hardened wetwell vents. This will include interactions with

stakeholders to develop the technical bases and acceptance criteria for suitable design expectations for reliable hardened vents.

NTTF Recommendation 8.1

Order licensees to modify the emergency operating procedures (EOPs) technical guidelines to (1) include EOPs, Severe Accident Management Guidelines (SAMGs), and Extensive Damage Mitigation Guidelines (EDMGs) in an integrated manner, (2) specify clear command and control strategies for their implementation, and (3) stipulate appropriate qualification and training for those who make decisions during emergencies.

NTTF Recommendation 8.2

Modify Section 5.0, “Administrative Controls,” of the Standard Technical Specifications for each operating reactor design to reference the approved EOP technical guidelines for that plant design.

NTTF Recommendation 8.3

Order licensees to modify each plant’s technical specifications to conform to Recommendations 8.1 and 8.2.

NTTF Recommendation 8.4

Initiate rulemaking to require more realistic, hands-on training and exercises on SAMGs and EDMGs for all staff expected to implement the strategies and those licensee staff expected to make decisions during emergencies, including emergency coordinators and emergency directors.

NRC Staff Recommendations 8.1-8.4

Issue an advanced notice of proposed rulemaking to engage stakeholders in rulemaking activities associated with the methodology for integration of onsite emergency response processes, procedures, training and exercises. Interact with stakeholders to modify the EOP generic technical guidelines in order to include guidance for SAMGs and EDMGs in an integrated manner and to clarify command and control issues as appropriate.

NTTF Recommendation 9.3

Order licensees to determine and implement the required staff to fill all necessary positions for response to a multi-unit event and provide a means to power communications equipment needed to communicate onsite (e.g., radios for response teams and between facilities) and offsite (e.g., cellular telephones and satellite telephones) during a prolonged station blackout.

NTTF Recommendation 9.4

Order licensees to complete the Emergency Response Data System modernization initiative by June 2012 to ensure multi-unit site monitoring capability.

NRC Staff Recommendations 9.3 and 9.4

1. Develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to (1) perform a staffing study to determine the required staff to fill all necessary positions to respond to a multi-unit event, (2) evaluate what enhancements would be needed to provide a means to power communications equipment necessary for licensee onsite and offsite communications during a prolonged station blackout event, and (3) inform the NRC of the results of the staffing study and any actions taken or planned, along with their implementation schedules, to react to the staffing study results and to enhance the communications equipment.
2. Evaluate licensee responses and take appropriate regulatory action.

On October 18, 2011, the Commission approved the staff's proposed actions to implement without delay the NTTF recommendations. Specifically for Recommendation 4.1, the staff was directed to designate the station blackout rulemaking as a high-priority rulemaking, with a goal of completion within 24 to 30 months.

Where appropriate, the New Jersey Nuclear Review Task Force has adopted and incorporated the above recommendations as shown below.

NEW JERSEY NUCLEAR REVIEW TASK FORCE RECOMMENDATIONS

These recommendations appear as included in the Task Force's June 27, 2011 interim report. As appropriate, updates have been added to address any changes that have occurred over the last five months, including the NRC decision to implement the NTTF recommendations.

1. Power Supply

- Work with Exelon and PSEG to develop procedures for government assistance in the movement of essential equipment to the facility in a timely and effective manner. (NJOEM)

Update: The NJOEM is responsible for coordinating, with the licensees, the means for reentry of plant personnel through access control posts. This activity would include the transit of equipment and resources such as fuel for generators. Following an event resulting in catastrophic failure of the roadway network, the NJOEM would in conjunction with the affected county, NJDOT, NJDEP, and licensee identify ingress and egress routes and direct restoration efforts to these routes.

The State of New Jersey and the licensees understand the need to have essential backup equipment available and staged for deployment during events at the plants. As part of the requirements of 10 CFR 50.54(hh)(2), licensees must identify and seek readily available agreements for additional offsite resources (both local and regional) that could support firefighting, electrical power, core cooling, and other needs. PSEG and Exelon are currently assessing their additional offsite resources needs

- Request that the NRC evaluate the interconnection of generators at the Artificial Island site to make them available to all three reactors. (NJDEP)

Update: The NRC is initiating rulemaking activities to enhance the capability to maintain safety through a prolonged station blackout. These activities will include the development of a regulatory basis, a proposed rule, and implementing guidance. The purpose of recommending the interconnection of generators at Artificial Island was to enhance safety through a prolonged blackout. This NRC initiative will achieve the same end while broadly evaluating all possible scenarios at Artificial Island and Oyster Creek to address a prolonged station blackout. Therefore, the Task Force has modified this recommendation to more generally address prolonged station blackout and not focus on any specific improvements until all potential changes are thoroughly evaluated.

2. Spent Fuel Storage

- Request that the NRC modify 10 CFR 50.54(hh)(2) to expand the number of emergency diesel driven pumps so that emergency cooling can be provided for all systems that may be damaged. Separate pumps should be available for each reactor and spent fuel pool on site. (NJDEP)

Update:The NRC is in the process of developing and issuing Orders to licensees to provide reasonable protection of the equipment to satisfy the requirements of 10 CFR 50.54(hh)(2) from the effects of external events, and to establish and maintain sufficient capacity to mitigate multi-unit events. This NRC initiative is consistent with the Task Force recommendation.

In correspondence dated December 16, 2011 to the Mayor of San Clemente, California, R.W. Borchardt, NRC Executive Director for Operations, stated that information obtained to date regarding the nuclear disaster in Japan indicates that no offsite radioactive release occurred from spent fuel stored in the pools or dry casks at Fukushima Dai-ichi.

- Support regional agreements between licensed operators to provide access to redundant pumps and generators in the event there are failures of onsite equipment. (NJDEP)

Update:Industry is currently surveying available equipment with the intent of establishing regional agreements and staging equipment by the end of 2012.

- Support additional monitors to view spent fuel pool level from multiple locations. (NJDEP)

Update: This recommendation is consistent with both the NRC and Industry approach to enhancing spent fuel pool monitoring.

- Restate the urgency of a national depository for spent fuel to the NRC and department of Energy. (NJDEP)

Update: The Blue Ribbon Commission on America's Nuclear Future is expected to deliver recommendations to the Department of Energy by January 29, 2012, which will be made public at a later date. One of the Commission's June 2011 draft report recommendations was to expeditiously and safely develop permanent deep geological disposal site(s) for spent fuel and high-level nuclear waste.

3. Emergency Planning Zone

- Request NRC confirmation of the Task Force conclusion that there is no technical or scientific basis to expand the current 10-mile emergency planning zone in the United States based upon the events in Japan. (NJDEP)

Update: On August 2, 2011, NRC Chairman Jaczko testifying before the U.S. Senate confirmed that the emergency planning (which includes the 10-mile EPZ) in the U.S. provides radiological protection to the members of the public, and that the only two aspects of the Japan accident that warranted additional consideration in the U.S. are emergency planning for prolonged station blackout events and emergency planning for multiple unit events.

4. Communication Tools

- Work closely with Exelon to ensure that battery back-up is installed in a timely manner for the siren network surrounding Oyster Creek. (NJOEM)

Update: Exelon began the replacement of its 400 alert and notification sirens throughout its multi-state reactor fleet with battery backed-up sirens in 2010. The sirens are distributed across four nuclear plant sites. This effort includes the replacement of the 42 Oyster Creek sirens in 2013 (physical work), to be placed in service in early 2014 upon FEMA approval.

However, Exelon is currently reviewing the resources of its installation vendor and its own internal resources to determine whether they could expedite the Oyster Creek installation forward into 2012 (physical work). Another Exelon site is also scheduled for 2012. Exelon will complete its review by the end of this year and inform NJOEM of the results.

- Explore alternative/additional IT/communication systems to increase the effectiveness and efficiency of delivering emergency messages to the public. (NJOHSP/NJOEM)

Update: The NJOEM recently upgraded its Emergency Alert System (EAS) through the installation of EMnet, affording the State of New Jersey greater coverage than the previous system. EMnet will broadcast directly to the County NJOEM as well as broadcasting messages via television and radio to the general public. The County NJOEMs have the capability of initiating a Reverse-911 call to inform their residents of an emergency, a capability NJOEM also has as a redundancy.

NJOEM will continue to explore alternative solutions to alert and notify the public. Emerging technologies such as the FEMA/FCC “Commercial Mobile

Alert System” (CMAS) are promising. CMAS is specifically designed to alert cellular device users of an important message. The system uses a new communications protocol similar to text messaging, but will have dedicated resources to prevent it from being overwhelmed in an emergency. Alerts will have a unique vibration and tone on new mobile devices and will be capable of providing the alert on a muted or silenced device. The FCC expects rollout of this program in 2012. It will take several years to fully integrate all cellular devices with this capability.

The use of social media has expanded in the delivery of critical information to the public and its use by the State. The State has relied upon social media sites such as Facebook and Twitter to keep residents informed during Hurricane Irene and other emergencies. Also, a program administered through NJOEM, NJAlert, sends a text alert to mobile devices regarding emergency events. NJAlert requires a subscription from the user to receive data. The NJOEM has initiated an aggressive outreach campaign to urge subscription to this free service.

Most back-up alerting systems rely on the existing infrastructure system, which could be compromised during a natural disaster. Therefore, route alerting (a mechanism of police and fire making notifications via vehicle mounted public address systems) remains the back-up notification mechanism that NJOEM would utilize to inform the public of a protective action.

- Support any Federal initiatives to exercise response to multiple natural disasters. Prior to the modification of existing Federal requirements, incorporate multiple event scenarios where possible. (NJOEM/NJDEP)

Update: The accident at Fukushima has shown that prolonged station blackout and multi-unit events (Salem/Hope Creek has three reactors) are possibilities that must be addressed as part of emergency preparedness. While extremely low probability, these events have the potential for severe consequences and require effective emergency planning.

NJOEM has begun this multi-unit response process at the state level with cooperation from the licensees, County NJOEMs, and other State agencies. The New Jersey Radiation Accident Response Act requires that an exercise is conducted for each facility annually. The most recent exercise of the Salem/Hope Creek site involved a challenging hurricane scenario along with an accident at the plant. Decision makers were required to consider actions essential for immediate protective actions for the 10-mile emergency planning zone (EPZ) along with their impact on protective measures for a hurricane.

Revisions to the FEMA Radiological Emergency Preparedness Program Manual now require “More Challenging Drills and Exercises.” The revision will include developing exercise scenarios that incorporate a broader spectrum of options regarding releases as well as initiating events to increase realism and minimize participant preconditioning. PSEG and Exelon are working with the State to incorporate natural and non-nuclear hazards as elements of the annual radiological exercise.

- Draft pre-written public messages that address the likely events that are expected to occur for a nuclear power plant accident. Pre-established public messages are more efficiently circulated to the public, promote consistency, and are more effective for the protection of public health and safety. (NJOEM/NJDEP/NJOHSP)

Update: Press releases and emergency alert system messages are prepared for anyplume and post-plume periods. Instructions for the public are maintained electronically by the NJOEM. The pre-written messages cover a wide range of topics for a plume or post-plume phase. As warranted, additional topics will be added to this library of messages to continue to enhance the State’s response program.

5. General Recommendations

- Incorporate the interaction between Federal and State government into exercises to clearly define roles and responsibilities. (NJOEM/NJDEP/NJOHSP)

Update: The NRC has participated in New Jersey exercises in the past, most recently in the 2010 Ingestion Pathway Zone exercise. The ingestion zone exercise covers 50 miles from the site and focuses on interdiction of crops, animals, and determining when its safe to return people to their homes. The Oyster Creek FEMA exercise scheduled for September 27, 2011 would have included participation from FEMA Incident Management Assessment Teams (IMATs), but the exercise was postponed due to Hurricane Irene and Tropical Storm Lee. The State hopes to incorporate IMAT in the FEMA exercise on May 22, 2012. The NRC will participate in the State’s 2012 Salem/Hope Creek exercise and the 2013 Oyster Creek exercise.

- Implement the appropriate IT upgrades to permit Plant condition information to be available to appropriate technical staff at the ROIC during exercises and actual emergencies. (NJOEM)

Update: Currently, the licensees and the State use two divergent consequence management software programs. The State uses a program known as E-Team, while the licensees utilize a program known as Web EOC. An upgrade to the existing E-Team server at the State should be completed by 2012; when that upgrade is completed, work will begin to create a “bridge”

between the State's E-Team server and the plant licensee's Web EOC program so that data can be shared. In addition, an IT upgrade to the ROIC will include installation of the Emergency Response Data System (ERDS), which will allow NJDEP staff (while stationed at the ROIC) to access direct electronic transmission of selected parameters from the data systems currently installed at licensee facilities.

- Coordinate with New York and Pennsylvania to plan and exercise those reactors that impact New Jersey. (NJOEM)

Update: The NJOEM has reached out to New York, Pennsylvania, Delaware, and Maryland and agreed in principle to meet and discuss exercises and other issues such as the new FEMA REP manual. The concept of a regional working group was discussed to include FEMA and NRC.

The NJOEM will contact New York in particular to coordinate New Jersey activities for the 2012 Indian Point Exercise to address that facility's potential impacts on New Jersey. Pending FEMA guidance for studies of estimated evacuation times require that scenarios include a shadow evacuation out to 15 miles, which includes portions of Bergen and Passaic Counties.

- Evaluate the current KI distribution protocol and modify as necessary. (NJDHSS)

Update: NJDHSS pre-distributes KI along with instructions for use during radiological emergencies to all schools and day care facilities within the 10-mile Emergency Planning Zones. NJDHSS has provided KI stockpiles to several larger companies located within the EPZ so that it can be quickly distributed to employees. Since the development of the state's KI policy in 2002, the NJDHSS has sponsored numerous local outreach events where KI is made available to all residents of the 10-mile EPZ. Beyond the public outreach sessions, NJDHSS provides county health agencies with a substantial stockpile of KI for distribution to any EPZ resident that makes a request. The state supplements the pre-distribution of KI to the public by stockpiling supplies of KI in each of the EPZ counties to be delivered to Reception Centers for distribution to evacuees in the event of an accident.

FINALSUMMARY

Since the creation of the Nuclear Review Task Force on March 25, 2011, the Task Force members have had an ongoing dialogue with the NRC and the Nuclear Facilities Licensees. Our primary focus has been on all our efforts to maximize the protection of New Jersey residents. Based upon the information provided by the NRC and the licensees, the Task Force members have a high level of confidence that New Jersey's nuclear power plants are operating safely and have effective mitigation plans to address the lessons learned from the Fukushima incidents. The Task Force has a high level of confidence that the State has the emergency preparedness plans and continuous preparation exercises necessary to protect the public and will use the lessons learned to continue to enhance our State's emergency planning process.

The Task Force agrees with and fully supports the actions taken to date by the NRC in response to the Japan tragedy, and New Jersey will continue to work closely with the NRC and other federal agencies as appropriate to ensure that the lessons learned serves to further strengthen our emergency planning and response organizations.

- **Power Supply:** Ask the NRC to enhance safety during station blackouts at all New Jersey sites; and work with Exelon and PSEG to develop procedures to quickly move essential equipment to deal with potential emergencies.
- **Spent Fuel Storage:** Increase the number of emergency diesel pumps at nuclear plants to handle cooling for all damaged systems; add monitors to view the spent fuel pool level from multiple locations; create regional agreements between nuclear plant operators to provide access to redundant pumps and generators; press the NRC and Federal department of Energy to create a national depository for spent nuclear fuel.
- **Emergency Planning Zone:** Request NRC confirmation that there is no technical or scientific basis to expand the current 10-mile EPZ.
- **Communications:** Ensure battery backup is installed in a timely manner for siren network surrounding Oyster Creek; seek alternative methods to increase the effectiveness of delivering emergency messages to the public; support Federal initiatives for emergency preparedness drills that feature multiple natural disasters.
- **General Recommendations:** Coordinate with New York and Pennsylvania to plan emergency response exercises for those reactors that impact New Jersey; more clearly define the roles and responsibilities of the State and Federal government in handling potential emergencies; implement needed IT upgrades at the State's emergency response headquarters.