STATEMENT
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UNITED STATES NUCLEAR REGULATORY COMMISSION
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SUBCOMMITTEE ON ECONOMIC DEVELOPMENT, PUBLIC BUILDINGS, AND EMERGENCY MANAGEMENT

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Good morning, Mr. Chairman and Members of the Subcommittee. I am pleased to appear before you on behalf of the United States Nuclear Regulatory Commission (NRC) to discuss our emergency planning and preparedness programs at nuclear power facilities in the United States, and to discuss the protective action guidance recently issued by the U.S. Ambassador to American citizens in Japan in response to the events at the Fukushima-Daiichi nuclear power plant site.

NRC's primary mission is to regulate nuclear reactors, materials, and waste facilities in a manner that protects the health and safety of the public and promotes the common defense and security. Emergency preparedness is a key element of the "defense in depth" safety philosophy we employ for nuclear power plants. This philosophy ensures high quality in design, construction, and operation of nuclear power plants; requires redundant safety systems that reduce the chances that malfunctions will lead to accidents; and recognizes that in spite of all these precautions, unforeseen events could occur. Through emergency planning and preparedness, mechanisms are in place to protect the public in the unlikely event that these measures fail.

The NRC emergency preparedness and planning regulations are extensive and require the licensee to develop and demonstrate an effective emergency plan as a condition of their

license. The nuclear power plant operator is required to provide extensive emergency response training to emergency plant workers. For example, they are required to provide severe accident management training to control room operators, and to demonstrate personnel response in a rigorous drill and exercise program. The NRC inspects licensees to ensure that they are meeting emergency preparedness requirements and monitors performance indicators related to emergency preparedness.

To form a coordinated system of emergency preparedness and response, the NRC works with licensees; Federal agencies; State, Tribal, and local officials; and first responders. This program includes an every-other-year full participation exercise that engages both the onsite and offsite response organizations as well as Federal Emergency Management Agency (FEMA). These exercises are evaluated by both FEMA (offsite) and NRC (onsite) staff. NRC resident inspectors also observe licensee on-site emergency drills and exercises. It is safe to say that over the 30-plus years of operating history and at 104 operating nuclear power plants, there have been thousands of drills and exercises designed to ensure optimum response to abnormal and emergency conditions.

For planning purposes, we define two emergency planning zones, or EPZs, around nuclear power plant sites. The first zone, called the Plume Exposure Pathway EPZ, is an area covering a 10-mile radius around a nuclear power plant. This is the area that would require the most immediate protective actions as it has the greatest potential for exposure from a release. Planning for this area is comprehensive and includes such protective actions as evacuation, sheltering, and administration of potassium iodide, as appropriate, for members of the public.

Consideration of these protective actions is prompted at very low projected dose levels. A second emergency planning zone, called the Ingestion Pathway EPZ, covering a 50- mile radius

around each plant is also established to deal with potential lower-level, long-term risks primarily due to exposure from ingestion of contaminated food, milk, and water. This comprehensive planning within the 10 and 50 mile EPZs provides a substantial basis for expansion of response efforts in the event that this is necessary.

Let me now address the NRC's recent protective action recommendation for U.S citizens in Japan to evacuate out to 50 miles from the Fukushima-Daiichi site. That decision was based on the best information available during an evolving event. NRC began monitoring the event when the tsunami warning was issued for Hawaii and the west coast of the United States. The information flow from the Fukushima site was often confusing and conflicting. In order to provide timely information to the U.S. Ambassador to Japan, and to best protect the health and safety of U.S. citizens in Japan, we based our assessment on the conditions as we understood them at the time. This site has six nuclear power plants and 4 of the plants are facing extraordinary challenges. Units 1, 3 and 4 appeared to have suffered significant damage as a result of reported hydrogen explosions. We suspected that the concrete, secondary containment buildings were severely damaged by the explosions and may not be capable to perform their function of stopping the release of radiation. Unit 4 was in a refueling outage and its entire core had been transferred to the spent fuel pool a little more than 3 months earlier. This means that there was irradiated fuel that had been freshly loaded into the spent fuel pool that was in danger of overheating if the water level dropped, and there were indications that was happening. Additionally, radiation monitors were showing very high levels of radiation on the plant site, which would pose challenges to plant crew attempting to stabilize the reactors, and there were offsite readings indicating that fuel damage had occurred.

Since communications were limited and there was a large degree of uncertainty about plant conditions at the time, it was difficult to accurately assess the radiological hazard. In order to

determine the proper evacuation distance, the NRC staff performed a series of calculations using NRC's RASCAL computer code to assess possible offsite consequences. The computer models used meteorological model data appropriate for the Fukushima Daiichi vicinity. Source terms were based on hypothetical, but not unreasonable estimates of fuel damage, containment, and other release conditions. These calculations demonstrated that the Environmental Protection Agency's Protective Action Guidelines could be exceeded at a distance of 50 miles from the Fukushima site, if a large-scale release occurred from the reactors or spent fuel pools. We understood that some of our assumptions were conservative, but believed that it was better to err on the side of protection, especially in the case of a seemingly rapidly deteriorating situation.

If this situation had occurred in the United States, the NRC has resident inspector staff at the plants that can report back to the Region and Headquarters on conditions as they are evolving. In addition, we are able to readily access "live-time" plant parameters and radiation monitors, as well as talk directly to our licensee and emergency management officials allowing us to refine our understanding and consequence assessments. The licensee would then make a recommendation to State or local officials on what protective actions to take. With the Fukushima event we had to make our best decision with what we had available. The Emergency Preparedness framework provides for the expansion of the emergency planning zones as conditions require. Acting in accordance with this framework and with the best information available at the time, the NRC determined that evacuation out to 50 miles for U.S. citizens was an appropriate course of action, and we made that recommendation to other U.S. Government agencies.

This concludes my testimony. Thank you for the opportunity to present this testimony. I would be happy to answer your questions.