

Responses to Open Questions from July 28, 2011, Public Meeting to Discuss the Results of the Near-Term Task Force

1	<p>Question: During the public meeting, it was my understanding the Nuclear Regulatory Commission's (NRC's) Task Force stated their intention was to have licensees reevaluate their plants using current NRC requirements and guidance that has been established for new plants (under Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) 52 and 10 CFR 100.23 requirements, if the application is submitted after January 10, 1997). Current criteria would then mean invoking a site-specific probabilistic seismic hazard analysis, a new safe shutdown earthquake (SSE) design ground motion per Regulatory Guide (RG) 1.208, and updating the building seismic models and soil-structure interaction analyses to current NRC guidance to calculate new seismic demands and in-structure response spectra. Please confirm or provide clarification on the use of current NRC requirements and guidance.</p> <p>Response: The Task Force confirms that Recommendation 2.1 was intended to require licensees (pending Commission action on Task Force recommendations), to perform a site-specific probabilistic seismic hazard analysis, to develop a new SSE design ground motion per RG 1.208, to update the building seismic models and soil-structure interaction analyses to current NRC guidance, and to calculate new seismic demands and in-structure response spectra.</p>
2	<p>Question: Please provide clarification on the phrase "update the design basis." What is meant by "update"? Does "update" mean a complete evaluation of the existing structures, systems, and components (SSCs) and potential for soil liquefaction to the new seismic demand and modify or replace SSCs to meet the current (new plant) licensing criteria? If so, would this mean the updated seismic design basis would replace the existing seismic design basis that was originally part of the licensing basis of the plant?</p> <p>Response: The Task Force confirms that "update" was intended by the Task Force to mean a complete evaluation of the existing SSCs, which are required to be seismically-qualified, and the potential for soil liquefaction to the new seismic demand and to modify or replace SSCs to meet the current (new plant) licensing criteria and that the updated seismic design basis would replace the existing seismic design basis that was originally part of the licensing basis of the plant.</p>
3	<p>Question: New plant criteria require confirmation that sufficient seismic margin exists above the design basis. Is the intent to require existing plants to demonstrate similar seismic margin above the new design basis?</p> <p>Response: The Task Force confirms the intent of Recommendation 2.1 is to require existing plants to demonstrate seismic margin above the new design basis.</p>
4	<p>Question: To demonstrate defense-in-depth, can an alternate to updating the plant seismic design basis be a seismic probabilistic risk analysis or some form of a seismic margin analysis?</p> <p>Response: At this time, the Commission is considering the Task Force recommendations. If Recommendation 2.1 is approved, then the implementation details would need to be developed, including any flexibility that may be acceptable in meeting the intent of the proposed requirements.</p>
5	<p>Question: For the re-evaluation of the seismic and flood hazard for each site that was recommended to be redone every 10 years by the Task Force, would that information be required to be part of the Final Safety Analysis Report (FSAR) for each site? For example, would each new report have to be put into the FSAR for that plant with the FSAR being revised after each report? How would each new report be handled?</p> <p>Response: Recommendation 2.2 regarding confirmation of seismic and flooding hazards</p>

	<p>every 10 years was recommended as a rulemaking. If the Commission approves this recommendation, then the details, including any requirements to update the FSAR, would be determined as part of the development of the rule and associated implementation guidance.</p>
6	<p>Question: One of the Task Force members talked about severe accident management guidelines (SAMGs), emergency operating procedures (EOPs), and extensive damage mitigation guidelines (EDMGs) being more integrated into the operator training program. Would this be something only in licensed operator requalification training, or would this be in the initial licensing phase, as well? If this was in the initial licensing phase, would this be something that the NRC would require to part of the knowledge and abilities catalog?</p> <p>Response: The Task Force envisioned that requiring and integrating EOPs, SAMGs, and EDMGs would make them subject to both initial and requalification training, since all three would be regulatory requirements. If the Commission approves this recommendation, the NRC's staff responsible for operator licensing and training will develop more specific guidance and expectations.</p>
7	<p>Question: At one point during the meeting, someone mentioned the possibility of having permanently staged radiation monitoring equipment for on-site dose measurement at the site boundary. It was suggested that this could even be accessed by real-time through the internet. What type of surveillance program would be required to ensure that this equipment would operate properly, so as to not cause a panic if one of this monitors were to fail?</p> <p>Response: The recommendation for real-time radiation monitoring was designated as a subject for longer-term evaluation. If the Commission approves this recommendation, questions, such as the good one you raise on surveillance requirements, would be addressed with stakeholders as the staff explores the issue.</p>
8	<p>Question: There was considerable discussion about the spent fuel pools. The recommendations to improve instrumentation and the ability to get water to the pools are sound recommendations. I would like clarity on why there was no recommendation to move spent fuel out of the pools and into dry storage. I understand that the older fuel does not generate much in the way of thermal heat. However, if there was severe damage to a spent fuel pool because of a seismic event or some other event, it seems as though it would be good to have much less potential source term sitting in those pools. It is far less vulnerable in dry storage. Was the cost to the utilities a consideration, or was it solely a safety decision?</p> <p>Response: The Task Force evaluated the issue of spent fuel in spent fuel pools and did not find a safety case that would necessitate movement of fuel out of spent fuel pools. The Task Force considered a severe natural disaster which might damage the structural integrity of the spent fuel and determined that cooling water makeup/spray would keep the fuel cool (hence, the recommendations regarding pool cooling). In addition, "old," cool spent fuel has the potential to be cooled by air. Cost to the utility was not a consideration in the development of the Task Force's conclusions.</p>
9	<p>Question: Senator Kirk, in his comments, talked about expanding the emergency planning zone (EPZ) from 10 miles to about 12 ½ miles. I believe the off-site emergency planning zones fall under the Federal Emergency Management Agency's authority rather than the NRC's. Was there any discussion or consideration about whether to recommend an expansion of the 10 mile plume planning zone or the 50 mile ingestion planning zone, or both?</p> <p>Response: The Task Force evaluated available information from Fukushima and did not see a safety case for expanding the 10 mile EPZ, as the current emergency planning basis provides for the expansion of protective actions beyond 10 miles, if necessary (see Section</p>

	<p>4.3.2 of the Task Force report). The Task Force did not evaluate the adequacy of the 50 mile EPZ, as there was no information from Fukushima that indicated a 50 mile ingestion pathway would be challenged. If areas should arise from a continuing review of the events in Japan, the NRC will evaluate those for insights into the planning basis in the United States (detailed Recommendation 11.2).</p>
10	<p>Question: It has been reported that the sequence of events recorder data was lost. Can you, or any other entity, identify what equipment, piping, structures, etc., were damaged from the seismic event vs. the tsunami, or equipment that was out of service, or failed from other causes during the event? An approximate timeline of failure is also requested.</p> <p>Response: The seismic event caused a loss of offsite power. Other systems necessary to ensure the safety of the units functioned as designed. Diesel generators and station batteries provided alternating current (AC) and direct current power for emergency cooling systems. The status of specific pieces of non-essential equipment which may have been out of service at the time of the seismic event or damaged as a result of the seismic event may never be known. Although lessons learned of limited value could be derived from such knowledge, subsequent events have precluded any meaningful forensic analysis of non-essential equipment status during the time period immediately following the earthquake before the tsunami struck.</p> <p>The tsunami flooded the lower levels of the reactor and turbine buildings and damaged beyond recovery all the diesel generators on Units 1 through 5, all the station batteries on Units 1 and 2, and much of the electrical switch gear on Units 1 through 4. An air-cooled diesel generator remained operable on Unit 6 and was used to power the equipment necessary to bring Units 5 and 6 to cold shutdown.</p> <p>The following link provides an overview of the events including a timeline.</p> <p>http://www.tepco.co.jp/en/nu/fukushima-np/f1/images/f12np-gaiyou_e_1.pdf</p>
11	<p>Question: According to the International Atomic Energy Agency Mission Report, addressing the core degradation sequence for Units 1 through 3, it is stated that “Core damage is calculated to have begun four hours after the trip and a majority of the fuel in the central region of the core was melted at 5.3 hours after the trip.” Does this rapid degradation of plant systems and loss of cooling (in response to the seismic event or tsunami) cause concern for the NRC philosophy of leak-before-break? Should this be considered in reassessing emergency planning assumptions?</p> <p>Response: The plants at Fukushima survived the earthquake and tsunami without challenge to the leak-before-break philosophy.</p> <p>The leak before break philosophy contends that a pipe crack will leak for some time before propagating to the point of catastrophic pipe failure. Leakage detected from incipient cracks gives plant operators warning and provides ample time to shut down a reactor before a large break loss of coolant accident can occur.</p> <p>Seismic design of plant systems prevented a catastrophic pipe failure during the earthquake. The rapid degradation of safety systems as a result of the tsunami was not a failure to detect a pipe crack in the incipient stage.</p>
12	<p>Question: Are there other recommendations or issues for further study that were looked at by the NRC team, but did not make it into the 90-day report? Is there a “B” list? Where will these issues be addressed?</p> <p>Response: Any items discussed by the Task Force which did not make the report did not</p>

	<p>have sufficient basis for specific mention in the report. As such, there is no “B” list. Any additional or different issues, including new evaluations in areas that were outside of the Task Force’s charter, will be developed and reviewed during the NRC’s longer-term review of the Japanese earthquake.</p>
13	<p>Question: The NRC has proposed recommendations regarding station blackout (SBO). Would you consider putting a hold on any changes to all plants for changes dealing with on-site power generation (such as extending the emergency diesel generator out of service time during operation)?</p> <p>Response: The NRC requires that all nuclear power plants are able to withstand an SBO, the complete loss of AC electric power to the essential and nonessential switchgear buses in a nuclear power plant. These requirements are specified in 10 CFR 50.63, “Loss of all alternating current power,” and a more detailed definition is provided in 10 CFR 50.2, “Definitions.” The Commission has indicated that certain lessons learned from Fukushima can be used to improve the NRC’s regulatory framework. The Commission has also noted that some of the recommendations from the Near-Term Task Force report raise very complex technical and regulatory questions that will require significant analysis.</p> <p>Since the events in Japan continue to evolve, the NRC has used, and will carry on using, the analytical resources and stakeholder engagement capabilities of the agency to ensure the consideration of many issues. There has been no reduction in the licensing or oversight function of the NRC as it relates to any of the NRC licensees. Factors which lead to the conclusion that the current fleet of reactors and materials licensees continue to protect the public health and safety are based on a number of principles, including defense-in-depth. Every reactor in the United States is designed for natural events, based on the specific site where the reactor is located.</p>
14	<p>Question: Will questions and answers submitted after the meeting closed, be included as part of the official record, or with the transcript? These questions, if time would have allowed, would have been asked during the meeting and been recorded as part of the meeting.</p> <p>Response: The questions will not be included as part of the transcript for the meeting. However, responses to the questions will be posted on the NRC public website, at the following location: http://www.nrc.gov/japan/japan-meeting-briefing.html. The questions and answers will also be maintained as official agency records in the Agencywide Documents Access and Management System, along with the transcript and other materials related to this meeting.</p>