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NRC'S JAPAN TASK FORCE RECOMMENDS CHANGES TO DEFENSE IN DEPTH MEASURES AT NUCLEAR PLANTS; CITES STATION BLACKOUT, SEISMIC, FLOODING AND SPENT FUEL POOLS AS AREAS FOR IMPROVEMENT

The Nuclear Regulatory Commission's Japan Task Force has proposed improvements in areas ranging from loss of power to earthquakes, flooding, spent fuel pools, venting and preparedness, and said a "patchwork of regulatory requirements" developed "piece-by-piece over the decades" should be replaced with a "logical, systematic and coherent regulatory framework" to further bolster reactor safety in the United States.

The report has been given to the five members of the Nuclear Regulatory Commission, who are responsible for making decisions regarding the Task Force's recommendations.

While declaring that "a sequence of events like the Fukushima accident is unlikely to occur in the United States" and that plants can be operated safely, the Task Force also recognized that "an accident involving core damage and uncontrolled release of radioactivity to the environment, even one without significant health consequences, is inherently unacceptable." Thus, the Task Force developed a comprehensive set of 12 recommendations – many with both short and long term elements – to increase safety and redefine what level of protection of public health is regarded as adequate. It also recommended additional study of some issues.

"Our recommendations are grouped into four areas beyond the overarching suggestion to clarify the agency's regulatory framework," said Charles Miller, an NRC veteran who was about to retire when tapped to lead the review team. "We looked at ensuring protection, enhancing accident mitigation, strengthening emergency preparedness and improving the efficiency of NRC programs. The independence given our team was outstanding. Everything was on the table and we felt free to take a holistic approach to these key subjects."

"We asked the Japan Task Force to undertake a systematic and methodical review of our processes and regulations to determine if the Commission should make additional improvements in our regulations and to give us recommendations for policy direction. This comprehensive report fulfills that charter," said NRC Chairman Gregory Jaczko. "I am proud of the diligence and dedication of the Task Force and look forward to working with my fellow commissioners to respond to these recommendations."

On July 19 the Commission will meet to hear from Miller and his team, and pose questions about their nearly four-month effort. On July 28 the Task Force will hold a public meeting to discuss the report, and members will appear before the Advisory Committee on Reactor Safeguards on Aug. 17. Additional meetings may be scheduled to seek public input on the recommendations.

The report noted that the current NRC approach to regulation includes requirements for protection and mitigation of design-basis events, requirements for some “beyond-design-basis” events through regulations, and voluntary industry initiatives to address severe accident issues.

“This regulatory approach, established and supplemented piece-by-piece over the decades, has addressed many safety concerns and issues, using the best information and techniques available at the time. The result is a patchwork of regulatory requirements and other safety initiatives, all important, but not given equivalent consideration and treatment by licensees or during NRC technical review and inspection. Consistent with the NRC’s organizational value of excellence, the Task Force believes that improving the NRC’s regulatory framework is an appropriate, realistic and achievable goal,” said the report.

The authors added, “Continued operation and continued licensing activities do not pose an imminent risk to public health and safety. However, the Task Force also concludes that a more balanced application of the Commission’s defense-in-depth philosophy using risk insights would provide an enhanced regulatory framework that is logical, systematic, coherent and better understood. Such a framework would support appropriate requirements for increased capability to address events of low likelihood and high consequence, thus significantly enhancing safety.”

By recommending a more “coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations,” the report recommends:

- Requiring plants to reevaluate and upgrade as necessary their design-basis seismic and flooding protection of structures, systems and components for each operating reactor and reconfirm that design basis every 10 years;
- Strengthening Station Black Out (SBO) mitigation capability for existing and new reactors for design-basis and beyond-design-basis natural events – such as floods, hurricanes, earthquakes, tornadoes or tsunamis – with a rule to set minimum coping time without offsite or onsite AC power at 8 hours; establishing equipment, procedures and training to keep the core and spent fuel pool cool at least 72 hours; and preplanning and pre-staging offsite resources to be delivered to the site to support uninterrupted core and pool cooling and coolant system and containment integrity as needed;
- Requiring that facility emergency plans address prolonged station blackouts and events involving multiple reactors;
- Requiring additional instrumentation and seismically protected systems to provide additional cooling water to spent fuel pools if necessary; and requiring at least one system of electrical power to operate spent fuel pool instrumentation and pumps at all times. The Task Force noted it will take some time for a full understanding of the sequence of events and condition of the spent fuel pools. The report said based on information available to date the two most cogent insights related to the availability of pool instrumentation and the plant’s capability for cooling and water inventory management;

- Requiring reliable hardened vent designs in boiling water reactors (BWRs) with Mark I and Mark II containments;
- Strengthening and integrating onsite emergency response capabilities such as emergency operating procedures, severe accident management guidelines and extensive damage mitigation guidelines;
- Identifying, as part of the longer term review, insights about hydrogen control and mitigation inside containment or in other buildings as more is learned about the Fukushima accident;
- Evaluating, as part of the longer term review, potential enhancements to prevent or mitigate seismically induced fires or floods;
- Pursuing, as part of the longer term review, additional emergency preparedness topics related to SBO and multiunit events;
- Pursuing, as part of the longer term review, emergency preparedness topics on decision making, radiation monitoring and public education;
- Strengthened regulatory oversight of plant safety performance – the NRC’s Reactor Oversight Process by which plants are monitored on a daily basis – by focusing more attention on defense-in-depth requirements.

The report also acknowledged work on flooding and seismic issues under way at the NRC before the March 11 Fukushima event. The short-term review will be followed by a longer term review with a report with recommendations for the Commission’s consideration within six months.

Editors: The full report can be found at this [link](#). The broad area recommendations are contained in the Executive Summary. Detailed proposed actions – either rulemaking or “orders” – can be found in Appendix A.

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