UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CHAIRMAN

February 15, 2013

The Honorable Fred Upton
Chairman, Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515

Dear Chairman Upton:

On behalf of the U.S. Nuclear Regulatory Commission, I am responding to your letter dated January 15, 2013, outlining concerns you and your colleagues have regarding ongoing agency activities resulting from the Fukushima accident in Japan, and requesting additional information.

I appreciate receiving your views; my fellow Commissioners and I will give them careful consideration. The additional information you requested is enclosed with this letter. If you have any additional questions, please contact me or Ms. Rebecca Schmidt, Director of the Office of Congressional Affairs, at (301) 415-1776.

Sincerely,

Allison M. Macfarlane

Enclosure:
As stated

cc: Representative Henry A. Waxman

Identical letter sent to:

The Honorable Fred Upton
Chairman, Committee on Energy
and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Henry A. Waxman

The Honorable Joe Barton
United States House of Representatives
Washington, D.C. 20515

The Honorable Marsha Blackburn
United States House of Representatives
Washington, D.C. 20515

The Honorable John Shimkus
United States House of Representatives
Washington, D.C. 20515

The Honorable Ed Whitfield
United States House of Representatives
Washington, D.C. 20515

The Honorable Steve Scalise
United States House of Representatives
Washington, D.C. 20515

The Honorable Phil Gingrey
United States House of Representatives
Washington, D.C. 20515

The Honorable William Cassidy
United States House of Representatives
Washington, D.C. 20515

The Honorable Renee Ellmers
United States House of Representatives
Washington, D.C. 20515

The Honorable Tim Murphy
United States House of Representatives
Washington, D.C. 20515

The Honorable Bill Johnson
United States House of Representatives
Washington, D.C. 20515

The Honorable Gregg Harper
United States House of Representatives
Washington, D.C. 20515

The Honorable Robert E. Latta
United States House of Representatives
Washington, D.C. 20515

The Honorable Ralph M. Hall
United States House of Representatives
Washington, D.C. 20515

The Honorable David McKinley
United States House of Representatives
Washington, D.C. 20515

The Honorable Pete Olson
United States House of Representatives
Washington, D.C. 20515

The Honorable Billy Long
United States House of Representatives
Washington, D.C. 20515

The Honorable Lee Terry
United States House of Representatives
Washington, D.C. 20515

The Honorable Adam Kinzinger
United States House of Representatives
Washington, D.C. 20515

The Honorable Leonard Lance
United States House of Representatives
Washington, D.C. 20515

The Honorable Gus M. Bilirakis
United States House of Representatives
Washington, D.C. 20515

Responses to Information Requests from Representative Fred Upton et al
Letter Dated January 15, 2013

1. When will the Commission conduct a full review of the regulatory differences between the U.S. and Japan that existed at the time of the accident?

a. Please describe how Japan's utilization of the "defense-in-depth" philosophy prior to the Fukushima accident differs from the NRC's.
b. Please describe how a fuller implementation by Japanese regulators of "defense-in-depth" philosophy might have altered the outcome of the Fukushima accident.

The United States Nuclear Regulatory Commission (NRC) has, to date, conducted a regulatory comparison of the station blackout regulations that existed in Japan at the time of the accident. The NRC continues to evaluate the various technical and regulatory factors in Japan that contributed to the accident at the Fukushima Dai-ichi nuclear power facility following the Great Tohoku Earthquake and subsequent tsunami. The NRC is cooperating with the Japanese government, including its recently created Nuclear Regulation Authority, we are cooperating with other international counterparts, and are participating in International Atomic Energy Agency conferences and meetings to assess the Fukushima Dai-ichi accident root causes and lessons learned. The NRC's goal is to collect lessons learned from all of these international evaluations and to incorporate these insights into our ongoing efforts to consider whether changes are appropriate to the regulation of nuclear power plants in the United States. The assessments performed by the NRC and other organizations have highlighted some similarities and some differences in specific regulatory requirements imposed on nuclear power plants in Japan and the U.S. Important factors contributing to the accident are detailed in the report of the Fukushima Nuclear Accident Independent Investigation Commission created by the National Diet of Japan. This report highlights vital lessons that must be learned by the Japanese authorities and plant operators.

Within the U.S., nuclear power plant operations are conducted in accordance with NRC regulations, informed by NRC guidance documents, industry guidance and initiatives, and controlled by programs developed by each licensee. The NRC is assessing all of these factors as we continue to more fully understand the Fukushima accident and its implications for the U.S. nuclear power plants. These assessments will continue to be documented in various reports and papers generated by the agency.

(a) The long history of cooperation between the U.S. and Japan in the design and operation of nuclear power plants has resulted in similar approaches to safety, including defense-in-depth protections. The nuclear power plants built in Japan were often designed and constructed jointly by U.S. and Japanese companies and similar plant designs can be found in both countries. There are, however, differences in how each country's plants were altered and updated over time as new information became available or new risks were identified. This type of evolution of plant features and operating practices represents enhancements of existing barriers by preventing or mitigating accidents that might challenge those barriers. For example, following September 11, 2001, the NRC required licensees to develop and implement guidance and strategies to mitigate potential losses of large areas of the plant due to explosions and fires. As noted in the National Diet of Japan's report on the Fukushima accident, such measures were not required in Japan at the time of the Great Tohoku Earthquake and subsequent tsunami.

(b) As mentioned above, an internationally recognized lesson from the Fukushima accident is the need to improve the ability of nuclear power plants to withstand potential beyond-design-basis external events, such as a large earthquake or tsunami. The loss of electrical power following the tsunami, and the eventual loss of plant systems needed to cool the reactor cores and containments, ultimately led to the release of radioactivity from the Fukushima plant. The addition of backup equipment to supplement current safety systems and development of mitigating strategies, such as those implemented in the U.S. following September 11, 2001, to address such external hazards and plant conditions might have supported the efforts of plant operators to mitigate the event at Fukushima Dai-ichi. These measures would provide additional protection for the existing barriers; including the reactor fuel, coolant systems, and containments.

The Commission has directed the NRC staff to compare U.S. and Japanese requirements in specific areas such as station blackout. In addition, on August 24, 2012, the Commission directed the NRC staff to compare practices for hydrogen control and practices for spent fuel transfer from pools to dry cask storage for plants in other countries with those of U.S. plants. The results of these comparisons will be provided to the Commission when the NRC staff provides their recommendations for resolving those activities.

2. Has the NRC reviewed the potential cumulative impacts of its post-Fukushima actions and proposals on licensees?

As directed by the Commission, the NRC staff addresses the cumulative effect of developing new or revised regulations primarily through interactions with stakeholders and the timely development of guidance related to the subject rulemakings. The processes are described in two papers to the Commission (SECY papers) dated October 11, 2011, and October 5, 2012. These processes are being used to develop the rulemaking plans for those Fukushima action items that involve changes to regulatory requirements established by the NRC.

Additionally, in its development of possible actions to address lessons learned from the Fukushima Dai-ichi accident, the NRC prioritized its actions to ensure the timely implementation of the most important safety improvements. The prioritization as described in a SECY paper dated October 3, 2011, consists of three tiers, ranging from actions that should be started without delay and for which sufficient resource flexibility exists (Tier 1), to those recommendations that require further study, are dependent upon completion of a shorter-term action, or need a critical skill set that is also needed for higher priority work (Tier 3). The staff's longer-term plans for addressing the Tier 3 items are described in a SECY paper dated July 13, 2012.

A guiding principle in our efforts continues to be ensuring these activities do not adversely affect the day-to-day safe operation of the current fleet of operating plants. Accordingly, the NRC staff has worked closely with the industry and taken into account the availability of agency and industry resources in developing plans and guidance for post-Fukushima activities. The staff has also recognized the overlap of certain activities and is currently working with industry to understand the impact of implementation dates to avoid unwarranted cumulative impacts of the requirements arising from the lessons learned from the Fukushima Dai-ichi accident. The Commission's regulations also require that the costs and benefits for any proposed regulatory action that is not needed to ensure adequate protection of public health and safety be analyzed.

3. Please provide a list of all proposed post-Fukushima actions that have been evaluated by the NRC, found lacking in safety significance, and eliminated from further consideration.

The NRC's assessments of the Fukushima accident, including the Near-Term Task Force report "Recommendations for Enhancing Reactor Safety in the 21st Century," determined that the continued operation of U.S. nuclear power plants does not pose an imminent risk to public health and safety. As already noted, the Commission has identified and prioritized certain activities. However, the NRC continues to evaluate potential lessons learned from the accident to determine if additional actions might be warranted. Additional suggestions or requests for the NRC to consider actions stemming from the Fukushima Dai-ichi accident are provided by various stakeholders in meetings, correspondence, and in formal petitions submitted to the agency. The NRC is reviewing each recommendation in accordance with established processes. A few of these have been identified for further evaluation and potential regulatory action. Others have been assessed, and the staff has determined that they do not warrant further regulatory action or they are being adequately addressed by other Fukushima-related activities. Examples of items considered but not acted upon or implemented include the immediate shutdown of operating plants, the installation of various systems, structures, and components (beyond ongoing actions), the staging of robots to provide access to contaminated areas, adding multiple and diverse instruments to measure parameters such as spent fuel pool level, and requiring all plants to install dedicated bunkers with independent power supplies and coolant systems. For many of these suggestions and proposed actions, the NRC determined that they are being adequately addressed by ongoing actions or planned evaluations (e.g., the mitigating strategies order and related industry initiative to develop a diverse and flexible coping capability (FLEX)).

4. Please describe the NRC staff's rationale for recommending a deterministic approach on the issue of filtered vents rather than:

a. The performance-based approach utilized by the Canadian Nuclear Safety Commission to address the very same issue of filtered vents; or
b. The performance-based approach used by the NRC to address the flooding and seismic issues.

The NRC staff described various options and its recommendation related to containment venting systems for boiling water reactors (BWRs) with Mark I and Mark II containments in a SECY paper dated November 26, 2012. For example, Option 4 outlined a performance-based severe accident confinement strategy akin to the Canadian approach. After analyzing the various options, the NRC staff recommended the installation of a filtered venting system for Mark I and Mark II containments, primarily to enhance the defense-in-depth features for these containment designs and to ensure a timely resolution of this issue. This matter remains before the Commission. Therefore, a final agency position has not yet been determined.

5. Please explain how the Commission's vote on the filtered vent issue may set a new precedent by altering NRC's definition of "adequate protection."

In the November 26, 2012, SECY paper, the NRC staff provided various options and its recommendation for containment venting systems for BWRs with Mark I and Mark II containments. That paper did not specifically propose that the Commission invoke the "adequate protection" provisions of the NRC's backfit process. In the paper, the NRC staff includes an assessment of the options, using qualitative and quantitative factors, as potential cost-justified safety enhancements rather than items that are necessary for adequate protection. A Commission decision to implement filtered vents in accordance with the staff's recommendation basis would not alter the NRC's approach to applying the adequate protection provision for essential safety improvements.

6. During the January 9, 2012, Commission meeting with stakeholders and agency staff on the issue of filtered vents, there was a discussion of cost estimates and, in some cases, the lack of detailed cost estimates.

a. Explain whether or not the Commission believes it is sufficient for staff to provide only vendor estimates of a filtered vent exclusive of site variability and the costs of analyzing, preparing, installing, testing, personnel training, building structures and support systems to fully incorporate such vents.
b. Does the Commission agree that, if the costs the staff did not consider are included, the proposed Option 3 will fail to meet cost-benefit analyses by an even greater margin?

(a) The estimated costs used in NRC backfit and regulatory analyses associated with possible new requirements should use the best available information and cover the total costs of equipment, site modifications, labor, and materials. The November 26, 2012, SECY paper includes the NRC staff's assessment of the costs and benefits of a filtering system for BWR Mark I and Mark II containments. The estimated costs for a filtering system included in the paper were intended to cover not only the equipment costs, but also the site-specific engineering and plant modification costs. The estimate used in the NRC staff's assessment was based upon discussions with vendors, regulators, and plant operators who have had experience with the installation of filtering systems at foreign nuclear power plants. The NRC staff acknowledged in the paper that there were uncertainties associated with the costs of the filtering systems, including the site-specific costs, and included information about the sensitivity of the cost/benefit assessment to the assumed total cost of the filtering system. Additional information has been provided to the agency by industry to further clarify costs for filtered vents. The Commission directed the staff to evaluate this information.

(b) The part of the cost/benefit assessment that can be represented in quantitative terms involves a comparison of the estimated costs of imposing new requirements against the potential averted costs associated with a plant accident. In the case of the filtering system for Mark I and Mark II containments, higher estimated costs of the plant modification would lessen the net benefits presented in the quantitative assessment compared to the base case presented in the November 26, 2012, SECY paper. However, the paper offers qualitative factors to be considered in the Commission's deliberations regarding the merits of the various options as well as the results of the quantitative assessment.