

**Responses to Questions from Representative Edward J. Markey
Letter of May 13, 2011**

1. Please fully describe the circumstances that led to the emergency shutdown at the Pilgrim nuclear power plant, and the results of your investigation thereof.

Reactor operators were restarting the reactor on May 10, 2011, after a planned outage. The reactor was declared critical, or capable of a self-sustaining nuclear chain reaction, just after noon that day. At this point, the reactor is generating no measurable amount of heat. Shortly thereafter, operators commenced the portion of the start-up process where heat begins to be generated by the reactor by withdrawing certain control rods, thus increasing the rate of nuclear fission. While attempting to establish a specified heat-up rate, the operators identified a higher than anticipated reactor heat-up rate, albeit still within the NRC licensed limit. In trying to manage the higher than anticipated heat-up rate, the operators made several manipulations of the control rods that reduced the heat generation rate of the reactor to a very low value. The operators later recommenced the withdrawal of control rods to again establish the specified reactor heat-up rate. However, during this manipulation of the control rods, the operators did not take into account the effects of a higher operating temperature and exceeded the predetermined setpoint established on two separate nuclear instruments (i.e., the Intermediate Power Range Monitors). This resulted in an automatic reactor scram, or shutdown, from a very low level of reactor power. After the reactor scram, all equipment operated as expected and the shutdown was completed safely. The event did not challenge any limits on the nuclear fuel.

In response to the potential operator performance issues raised by this event, an additional NRC inspector arrived on site on May 11 to assist the resident inspectors with their initial inspection efforts, and a Special Inspection Team (SIT) was dispatched to the site on May 16 to continue the NRC's review of this event. The NRC SIT is reviewing operator performance and decision-making prior to and during the reactor scram, Entergy Nuclear Operations' (Entergy or the licensee) response to the event, the lessons learned to date by the licensee, and the steps taken by Entergy to prevent this event from recurring. The SIT is currently awaiting Entergy's completion of its detailed root cause analysis of the event. Following the completion of the SIT's onsite review of the root cause report and additional inspection in this matter, an inspection report documenting the team's findings will be issued, typically within 45 days, and made available to the public.

2. For each of the last ten years, please provide me with a list of each "scram" that has occurred in the United States, including the name and location of the reactor, the date of the event, the cause of the scram, whether or not the NRC investigated the events, and if so, what the outcome of the investigation was (including any enforcement actions taken).

Attached is a list of all unplanned scrams since 2000. Additional information is provided for all scrams since 2007 for which a reactive inspection was conducted. In accordance with NRC's management directives and Inspection Manual Chapter 0309, events occurring at power reactor sites are analyzed to determine if they meet or exceed certain deterministic and risk criteria. When these deterministic and risk thresholds are exceeded, a reactive inspection team is dispatched to the site to gather additional information. All identified findings, regardless of their significance, have been entered into the licensee's corrective action program for resolution. Those findings identified as greater than very low safety significance (Green) will receive additional follow-up inspections.

Enclosure

3. Does the Commission concur that the events in Japan represent “new and significant” information regarding the potential duration, extent and circumstances of radiation releases that could accompany a catastrophic accident at or attack on a nuclear power plant? If not, why not, especially in light of the list of circumstances that have taken place in Japan that is included in Appendix A?

The Commission Near-Term Task Force has completed a review of the recent events in Japan. The report dated July 12, 2011, is publicly available. We will begin a longer-term review following the Commission’s review of the Near-Term report, and as soon as the staff has sufficient technical information regarding the events in Japan.

4. Will the NRC require licensees to amend their Environmental Reports for all pending license or re-license applications in light of the requirements of NEPA to include any “new and significant” information regarding the environmental consequences of their proposed activities? If not, why not, and how can the Commission conclude that the absence of a requirement to do so is consistent with the legal requirements of NEPA?

The staff will make any recommendations to the Commission for changes to current requirements following completion of the planned longer-term review. Once those recommendations have been received, the Commission will determine what changes, if any, should be implemented.

5. Will the NRC require the development or utilization of new software that is capable of modeling the duration and extent of the radiation releases that have been experienced at Fukushima as part of its requirements for licensees to comply with NEPA and/or other Commission-mandated analysis? If not why not, since the software used is apparently unable to provide realistic information?

The quality of estimates from existing modeling software is going to vary depending upon the nature of the inputs. Our ability to model releases from the Fukushima site was significantly limited because of the large degree of uncertainty we had regarding plant conditions. We used a number of prudent and conservative estimates for various factors considered by our model. A similar modeling activity conducted for a U.S.-based facility would be expected to rely on substantial real-time information regarding meteorological conditions and actual release data, thus substantially increasing the certainty of the information produced.

Attachment 1: Unplanned Scrams 2000 - Present

Attachment 2: Scrams with Reactive Inspections 2007 - Present