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Interim Staff Guidance JLD-ISG-2012-01; Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

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General Comment

See attached file(s)

Attachments

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Comments of Edwin Lyman, Senior Scientist, Union of Concerned Scientists, on the Draft Interim Staff Guidance for Compliance with Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" JL-ISG-2012-01

July 7, 2012

The guidance for compliance with Order EA-12-049 is crucially important in determining the ultimate effectiveness of the Order in reducing the severe accident risk at U.S. nuclear power plants and the needless threat that these plants now pose to public health and safety. We agree with Chairman Schultz of the Advisory Committee on Reactor Safeguards' Fukushima Subcommittee that "this is something we need to get right at this time." If the guidance merely serves to rubber-stamp the industry window-dressing exercise known as FLEX, then the NRC will fail to do its duty to protect the public by fully addressing the safety vulnerabilities that were revealed by the Fukushima disaster.

UCS has been concerned since late last year that the industry was creating "facts on the ground" when it began to procure equipment to be used for its FLEX strategy not only before the NRC had the opportunity to develop and issue requirements for such equipment, but even before the industry had come up with guidelines of its own. A cynic might interpret this haphazard approach as a "wag the dog" strategy that gave the industry the upper hand in setting the limits of any post-Fukushima regulatory requirements. (The reported cost of $1 to $2 million per plant for the FLEX equipment certainly would appear to be a bargain compared to what major safety upgrades would cost, such as the "hard core" in France.) Unfortunately, we believe that this in fact is what is happening. The NRC has proposed to endorse the NEI FLEX guidance, NEI 12-06 Rev. B1, with only minor modifications for operating reactor licensees. (For AP1000 combined operating license holders, the NRC is rightly rejecting the industry's outrageous attempt to exempt FLEX equipment from the requirements that would apply at operating reactors.)

The ACRS Fukushima Subcommittee pointed out numerous fundamental problems with NEI 12-06 Rev. B1 in their June 20, 2012 meeting. We share these concerns and incorporate by reference that discussion in these comments (transcript, ADAMS accession number ML121850321, pages 21-81). We urge the NRC to fully address each instance where the staff told the ACRS that it would "take back" a comment for review.

In particular, we find that the ISG needs, at a minimum, to include the following provisions:

1. The boundary conditions to be considered in establishing requirements following postulated beyond-design-basis events should be at least as severe as those experienced at Fukushima Daiichi. Otherwise, the NRC cannot claim that it is addressing all the lessons of Fukushima. This means that guidance, strategies and procedures must be developed for mitigating not only a loss of AC power, but also immediate loss of DC power and failure of electrical distribution systems, as occurred at Fukushima Daiichi Units 1 and 2. We note that during an April 24, 2012 public meeting, the NRC staff stated that the

guidance needed to address strategies for loss of distribution systems as part of the initiating event (ML12123A162), because the loss of all AC power specified in the Order encompasses a situation with a loss of the distribution system (i.e. it could be part of the reason for the loss of all AC, as was the case at Fukushima), but NEI representatives balked. The draft ISG appears to accept the NEI 12-06 Rev. B1 assumption that the distribution system will be available provided it is protected according to the plant's design basis. We note that loss of distribution systems would also affect availability of DC power, even if the batteries themselves were to survive a beyond-design-basis flood; hence we see a need to consider a situation with no DC power as well.

2. Mitigation strategies must also address scenarios in which core damage occurs and hence should also address the transition between the procedures for implementing the mitigation strategies and the Severe Accident Management Guidelines (SAMGs), as well as the adequacy of the SAMGs themselves. The current FLEX guidance considers only the prevention of core damage and ignores the very important complications that would arise if core damage could not be prevented.

3. Although we agree that the timelines for the three-phase approach should be site-specific and determined through analysis, we believe that minimum times for each phase should be established. In our comments on the Advance Notice of Proposed Rulemaking for the station blackout rule (SBO ANPR), we propose a minimum coping time of 24 hours for the first phase (installed equipment) and 7 days for the transition phase. We recommend the same durations be adopted here.

4. We strongly support the staff position that reliable backup power for hydrogen igniters for ice condenser PWRs and Mark III BWRs be incorporated into the mitigation strategies for both the initial and transition phases. The current voluntary initiative simply does not provide the level of assurance that is needed for maintaining the crucial containment integrity function. As UCS has repeatedly pointed out to the Commission, this should have been made a regulatory requirement long ago.

5. For all reactors where a credible common-cause seismic and flooding event can occur (e.g. upstream dam failures), the mitigations strategies should assume all the potential consequences of this event as its initial condition.

6. The ISG requires licensees to provide a "demonstration of how strategies will be implemented in all modes" and a "demonstration of the necessary procedures, guidance, training, acquisition, staging or installation of equipment needed for the strategies ...". This begs the question of what will constitute an adequate "demonstration." UCS has maintained all along that a credible demonstration must involve the development of a baseline set of beyond-design-basis scenarios and a detailed evaluation of the multiple success paths proposed for each scenario, considering the potential site conditions as realistically as possible. This approach is outlined in more detail in our comments on the SBO ANPR (ADAMS accession number ML12128A290). We incorporate that discussion by reference in our comments here. We do not believe that the evaluations

currently outlined in NEI 12-06 Rev. B1 for protection of FLEX equipment are comprehensive enough to fulfill this need.

We have noted previously that the elimination of a requirement for "procedures" in addition to "guidance and strategies" in the final 10 CFR 50.54(hh)(2) rule resulted in a lack of specificity in licensees' compliance plans that raised doubts about their ultimate effectiveness. To that end, we appreciate that the mitigation strategies order specifies that full compliance includes "procedures." However, we question whether the procedure hierarchy described in NEI 12-06 Rev B1 actually fulfills this requirement. The document proposes the development of FLEX Support Guidelines (FSGs), which would be "similar in intent as the current 50.54(hh)(2) guides." The ISG should ensure that the FSGs will be detailed enough to establish the practical usability and effectiveness of the mitigation strategies.

Assuming that compliance with this Order is only an interim measure until the rulemakings on SBO and integration of onsite emergency response are finalized, this analysis need not be as comprehensive as the analysis that should be required for compliance with these rules. However, the credibility of the mitigation strategies cannot be established without a concrete evaluation of the adequacy of the mitigation strategies with respect to at least a small number of challenging initiating events.

7. Key to the demonstration of success paths is the availability of equipment under the extreme situations that may occur. We continue to be concerned about the reliance on commercial-grade equipment for implementation of FLEX strategies, since this implies that not only will it not be assured to survive beyond-design-basis events, but it may not even survive design-basis events. We do not believe that the N+1 rule is adequate given the wide range of potential external events that must be considered. If safety margin is to be sacrificed in favor of diversity of location, then N+1 in general does not provide enough independent units for adequate diversity. Instead of a fixed formula, the actual numbers should be determined on a site-specific basis based on the range of threats that the site faces. NEI 12-06 also proposes, completely arbitrarily as far as we can see, that equipment can be out of service for up to 90 days at a time provided that a FLEX (N) capability is maintained --- meaning that there would be large periods of time when even nominal margin would not be maintained.