

Comments submitted December 22, 2015, by David Lochbaum, Director, nuclear safety project, on behalf of the Union of Concerned Scientists

- 1. Question EP-2: (a) What tiers and associated EP requirements would be appropriate to consider for this approach? (b) What factors should be considered in establishing each tier? (c) What type of basis could be established to support each tier or factor?**

The middle column on Federal Register page 72359 stated: *“Hence, postulated accidents involving failure or malfunction of the reactor, reactor coolant system, or supporting systems are no longer applicable.”* The non-applicability of reactor accidents is the catalyst for the ANPR aimed at adjusting regulatory requirements developed primarily with reactor operation in mind to the different needs of a decommissioning site.

The middle column on Federal Register page 72359 later stated: *“During reactor decommissioning, the principal radiological risks are associated with the storage of spent fuel onsite. ... The only accident that might lead to a significant radiological release at a decommissioning reactor is a zirconium fire. The zirconium fire scenario is a postulated, but highly unlikely, beyond-design-basis accident scenario that involves a major loss of water inventory from the spent fuel pool (SFP), resulting in a significant heat-up of the spent fuel, and culminating in substantial zirconium cladding oxidation and fuel damage.”* The Federal Register notice then described NRC activities related to spent fuel pools culminating in NUREG-1738 (ADAMS ML010430066), SECY-01-0100 (ADAMS ML101450420), post-9/11 security enhancements (ADAMS ML092990438), NUREG-2161 (ADAMS ML14255A365), and the order for spent fuel pool level instrumentation reliability (ADAMS ML12054A679). The Federal Register notice did not explicitly mention any NRC activities related to irradiated fuel in dry storage.

Just as cessation of reactor operation marks a clear delineation between the risks from reactor accidents and accidents during decommissioning, the completion of irradiated fuel transfers from spent fuel pools into dry storage provides an equally clear demarcation. The next and final demarcation would be when all irradiated fuel is transported offsite (assuming this step occurs before decommissioning is completed and the license terminated.)

The tiers during decommissioning are: (1) from cessation of reactor operation until removal of all irradiated fuel from the reactor vessel, (2) from removal of all irradiated fuel from the reactor vessel until removal of all irradiated fuel from the spent fuel pool, (3) removal of all irradiated fuel from the spent fuel pool until removal of all irradiated fuel from the site, and (4) from removal of all irradiated fuel from the site until termination of the license.

The emergency planning requirements for the first and fourth tiers are easily defined. The requirements in tier 1 should be the same as during reactor operation. The requirements in tier 4 can be totally eliminated.

The emergency planning requirements related to offsite protective action recommendations can be lessened in tier 2. But activities in tier 2 involve moving heavy spent fuel storage canisters around spent fuel pools. Even with single-failure proof cranes and safe transport paths employed during canister movements, the drop of a canister remains credible. A dropped canister could

damage the floor or wall of a spent fuel pool, allowing water to be drained. Radioactivity could be released from irradiated fuel damaged directly by the drop or subsequently by overheating related to the loss of water inventory from the pool. In addition to the safety hazard, irradiated fuel in spent fuel pools is a potential sabotage target. It would be prudent, therefore, to retain emergency planning requirements—albeit perhaps at a lesser extent than existing during reactor operation—during tier 2.

The emergency requirements related to offsite protective action recommendations can be eliminated in tier 3. But requirements related to training and coordination of offsite responders to dry storage problems need to be retained. With the significant reduction in staffing levels at decommissioning sites, it seems likely that offsite responders will be expected to assume a greater share of the response effort. Offsite responders must be equipped with the knowledge needed to make informed decisions about handling dry storage problems. For example, my father worked for Westinghouse's nuclear division back in the 1970s and told me about a leak of liquid sodium on backshift at their Waltz Mill facility outside Pittsburgh. The local fire department arrived and prepared to spray water on the burning liquid sodium. The security guards were fortunately able to persuade them not to do so.

2. **Question EP-4(b): Should nuclear power reactor licensees, once they certify under § 50.82 to have permanently ceased operation and permanently removed fuel from the reactor vessel, be allowed to make emergency plan changes based on § 50.59, “Changes, Tests, and Experiments,” impacting EP related equipment directly associated with power operations?**

As presently structured, 10 CFR 50.59 would have limited applicability in deciding when licensees can make emergency plan changes on their own and when proposed changes require NRC review and approval. The questions that must be answered under 10 CFR 50.59 are tailored to reactor operation. There's very little content in the supporting documents (i.e., the Final Safety Analysis Report and other design and licensing basis documents) governing irradiated fuel stored in spent fuel pools and even less—close to nothing—on irradiated fuel in dry storage onsite. Consequently, nearly every proposed change could be screened out based on not affecting the probability or consequences of accidents and transients described in the FSAR. Conversely, nearly every proposed change could be screened in based on introducing a previously unanalyzed accident or consequence outcome.

In order for 10 CFR 50.59 to play a meaningful role, licensees would have to develop a FSAR-like document specifically tailored at identifying hazards during the decommissioning and identifying risk management measures. This FSAR-like document would need to be submitted to the NRC for approval, providing appropriate opportunity for public comment. That NRC-approved document would provide the proper foundation for emergency planning measures—albeit at a lesser breadth and depth than needed during reactor operation—during the decommissioning period. If and only if this infrastructure was established would be it appropriate for 10 CFR 50.59 to determine when licensees can change emergency plans without prior NRC review and approval.

3. **EP-7: Under § 50.72(a)(1)(i), nuclear power reactor licensees are required to make an immediate notification to the NRC for the declaration of any of the emergency classes specified in the licensee's NRC-approved emergency plan. Notification of the lowest level of a declared emergency at a permanently shut down and defueled reactor facility may no longer need to be an immediate notification (e.g., consider changing the immediate notification category for a Notification of Unusual Event emergency declaration to a 1-hour notification). What changes to § 50.72(a)(1)(i) should be considered for decommissioning sites?**

After 9/11, the NRC revised its regulations (see 10 CFR 73.58 online at <http://www.nrc.gov/reading-rm/doc-collections/cfr/part073/part073-0058.html>) to require that plant owners make decisions regarding about safety with proper consideration of potential security implications and vice-versa. This regulatory requirement is explained further in NRC Regulatory Guide 5.74 (online at <http://pbadupws.nrc.gov/docs/ML0916/ML091690036.pdf>.) The NRC must practice what it preaches and explicitly consider security in its safety decision-making.

Irradiated fuel remains a potential sabotage target whether it is in a reactor core, a spent fuel pool, or a dry canister. Safety considerations alone might justify radical changes to the protocols for notifying the NRC about onsite events. But security considerations cannot be ignored. The NRC must be promptly notified about an actual or potential sabotage attack on irradiated fuel either in spent fuel pools or dry storage at decommissioning sites. Not only may sabotage pose a hazard at that site, but it could conceivably be the initial gambit in a larger assault on NRC-licensed facilities. Whether that prompt notification requirement resides in 10 CFR 50.72 or elsewhere does not matter. What matters is that the requirement exists within NRC's regulations that licensees promptly notify the NRC about actual or potential sabotage of irradiated fuel at decommissioning sites.