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General Comment

See attached file(s)

Attachments

HSER-5 Decommissioning Regulatory Comments

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ATTN: Rulemaking and Adjudications Staff
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The Conference of Radiation Control Program Directors (CRCPD) Committee on Emergency Response Planning (HS/ER-5) has been actively involved in the decommissioning process with the various stakeholders. Many of the HS/ER-5 committee members have had first-hand experience with the current decommissioning process. The CRCPD HS/ER-5 believes the efforts of the Nuclear Regulatory Commission (NRC) to develop a rule for Regulatory Improvements for Decommissioning Power Reactors is a positive step. We have reviewed the Draft Regulatory Basis Document for "Regulatory Improvements for Power Reactors Transitioning to Decommissioning" and appreciate the opportunity to comment.

Summary of Comments

For a number of years, the NRC has used risk-informed decision-making in regulatory matters and continues to encourage the use of probabilistic risk analysis (PRA). HS/ER-5 recognizes the importance of PRA analyses, but the proposed Draft Regulatory Basis Document seems to minimize the importance of some non-risk-based elements of emergency planning and remove a component of Defense-in-Depth in the regulatory policy for decommissioning reactors. Similar to the decision to leave the planning basis unchanged following the WASH-1400 "Reactor Safety Study –An Assessment of Accident Risks in U.S. Commercial Nuclear Plants", new risk studies should not be the sole basis for emergency planning policy with respect to spent fuel accidents.

When an operating reactor is decommissioning, many years have been invested in planning and partnerships between State and local officials, the utility, and the public. The Draft Regulatory Basis Document does not define fully the maintenance of these relationships. Although the risk is greatly reduced for a reactor during decommissioning, it does not go to zero. In light of the remaining risk, it is recommended to continue maintenance of the planning and partnerships that have been developed by the off-site response organizations (OROs) within the Emergency Planning Zone (EPZ).

HS/ER-5 supports the phased approach and agrees with the need to establish Level 1, 2, 3, and 4. Our comments are primarily related to the technical basis behind which the requirements for Level 2 have been established.

Those comments relate to the following five (5) topics:

1. The premise that an all-hazards emergency plan is adequate, as long as there is at least 10 hours before a zirconium fire occurs.
2. The diminished importance of Defense-in-Depth for decommissioning reactors.

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3. The exceedance of the early phase Protective Action Guidelines (PAG) as the basis for which radiological emergency plans are required.
4. The lack of consideration for any radiological consequences beyond the early phase of an accident.
5. The use of current PRA results in setting emergency planning requirements for decommissioning reactors, versus using over 40-year-old WASH-1400 PRA analysis for emergency planning requirements at operating reactors.

Detailed Comments

1. All-Hazards Plan

One of the arguments for relaxed emergency planning requirements for decommissioning reactors is that the planning can be handled by an all-hazards emergency plan. The main argument for use of an all-hazards emergency plan is that there will be adequate time for off-site authorities to take response actions using an all-hazards emergency plan. This rationale is repeated numerous times in the Draft Regulatory Basis Document to support relaxation of off-site emergency planning once Level 2 has been entered. In specific the Draft Regulatory Basis Document references a 10 hour heat up time for zirconium ignition as the time that has been used to support previous exemption requests. As described in NUREG-2161 “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor,” the reduced risk of early fatalities is, in part, due to the existence of a dedicated off-site emergency response plan specifically in place for radiological incidents at nuclear power plants. There is no supporting evidence that an all-hazards plan would have the same effect. Components of a dedicated radiological emergency plan such as emergency classification, prompt notification of OROs, and protective action decision-making can be crucial to protecting the health and safety of the public. Therefore, adequate emergency planning is necessary as long as there is fuel stored in spent fuel pools.

In summary, the use of an all-hazards plan appears to be based on a time requirement. The safe storage of high-level radioactive waste is mandated by the Nuclear Waste Policy Act of 1982, amended in 1987. Thirty years later, the Department of Energy (DoE) has not complied with this Act. The unique hazards posed by spent fuel demonstrate that an all-hazards plan is not adequate without additional measures.

2. Defense-in-Depth

In the Draft Regulatory Basis Document the NRC proposes a graded approach to EP that is commensurate with the reductions in radiological risk for a decommissioning reactor. For almost 40 years the NRC has chosen to maintain current emergency planning regulations as a key component of their Defense-in-Depth philosophy of nuclear safety. As stated above the emergency planning basis has not been changed as the calculated risk from a reactor accident has decreased. This has not happened because the NRC has maintained that the current emergency planning basis is not solely based on PRA analysis, but also has to account for the inherent uncertainty in risk analysis. HS/ER-5 believes that a reduction in emergency planning for decommissioning reactors cannot solely be based on PRA analysis but must also be based on the need for additional planning beyond what is called for in an all hazards emergency plan. In the Draft Regulatory Basis Document, the NRC maintains that the proposed technical basis includes consideration of Defense-in-Depth. HS/ER-5 believes that while this may be true to a certain extent, it is not the same level of Defense-in-Depth that currently exists in the emergency planning basis for operating reactors. Furthermore, even though the risk for off-site dose consequences from an accident at a decommissioning reactor may be lower when compared to an operating reactor, the risk is not zero. Hence, some form of

emergency planning requirements is not only prudent but should form the basis of a Defense-in-Depth strategy for decommissioning reactors, as well as operating reactors.

3. EPA PAGs

The Draft Regulatory Basis Document identifies the Environmental Protection Agency (EPA) PAG level for evacuation as the threshold value for whether or not an off-site emergency response plan for nuclear power plants is necessary to protect the health and safety of the public. The EPA PAG level was established as a guideline for emergency planning and was never intended to be enforced as a regulatory threshold for public radiation exposure to radiation emergencies. This value should not be explicitly used as a basis for the decision on whether an off-site emergency preparedness program is justified.

The NRC's current exemption process requires licensees to demonstrate that off-site impacts from any postulated accident after permanent cessation of operations be below the EPA PAG value for evacuation in order to approve emergency preparedness plan license amendment requests. This assessment is not sufficient to make the determination of whether or not a radiological emergency response plan specific for a nuclear power plant is the optimal strategy to serve the interests of public health and safety. The NRC should require that all accident studies bound the exposure levels for all postulated accidents in order to determine if an off-site response is necessary. Those studies should assess the risk reduction of a dedicated emergency response plan that has been developed, implemented and tested for adequacy on a regular basis and evaluated by the Federal Emergency Management Agency. It would be prudent to relax the requirement for off-site emergency preparedness when the dose savings projected from a dedicated emergency response plan for nuclear facilities no longer exceed those that could be realized using an all-hazards plan. Until such time, it is prudent to maintain off-site emergency plans, since they are more effective for protecting the public from unnecessary exposure to radiation.

4. Radiological Consequences Beyond Early Phase

The NRC should re-evaluate the basis for using the EPA PAG as the decision point for emergency preparedness requirements going forward. By using the EPA PAG threshold, the NRC requires that licensees only address the early phase dose of populations as a result of an accident at a fixed nuclear facility. As stated in NUREG/CR-7155 "Uncertainty Analysis of the Unmitigated Long-term Station Blackout of the Peach Bottom Atomic Power Station," the long-term phase dominates the overall health effect risk within the EPZ because the emergency response is faster than the onset of environmental release. More than half the time, the long-term phase is the larger contributor to overall health effect risks beyond the EPZ. Long-term health effect risk is largely controlled by the habitability criterion. This result demonstrates the importance of radiological emergency planning as opposed to all-hazards planning. In summary, at first glance, it may appear that the early phase emergency response is the only item to be considered in a dedicated radiological emergency plan. This is not the case. The need for planning beyond the early phase means that even if evacuations can be carried out by an all-hazard plan, the long-term protective actions cannot be carried out by all-hazard planning alone.

None of the basis documents for this Draft Regulatory Basis Document require licensees to evaluate and assess the potential environmental impact of a release that may be only a fraction of the EPA PAGs. Following an accident at a fixed nuclear facility and the release of radiation, there will be an extended period of intensive environmental sampling and analysis to evaluate the impact of residual contamination in the environment on food, water and milk and for exposure from continued habitation of the contaminated area by the public. These environmental assessments will occur regardless of the magnitude of the release and require the experience, knowledge and expertise of staff specifically trained for responses to these types of emergency conditions. None of the exemptions granted by NRC to date have asked the licensees to assess the long term environmental and public health impacts of a radiological

release considering all pathways for exposure. Similarly, there has been no evidence that licensees have evaluated the impact of a catastrophic failure of the spent fuel pool on groundwater and drinking water supplies from the intrusion of tritium from a liquid release of spent fuel pool inventory.

These additional assessments are of even greater importance for sites such as Zion Station that have large populations in very close proximity to the owner controlled area. The size and proximity of public populations has not been a factor in recent decisions but should be included as a consideration when evaluating the need for off-site preparedness and planning functions for state and local agencies.

5. Differences in PRA Application

The current emergency planning basis as defined in NUREG-0396 "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants" was based on the source terms from WASH-1400. These source terms were much larger than those reported in the SOARCA "State of the Art Reactor Consequence Analysis" report. In WASH-1400 Iodine was a dominant contributor to offsite dose. A major difference in offsite consequence analyses with the old WASH-1400 source terms and the more recent SOARCA source terms is the fact that the WASH-1400 source terms result in high doses in the range of up to ten miles, such that prompt health effects are of concern, whereas the dose in the ten mile range with the SOARCA source terms are in the dose response region where latent health effects are of interest. In summary the source terms (i.e., the quantity, type, and timing of radioactive material to the environment) used to form the emergency planning basis contained in NUREG-0396, are now recognized as little more than conservative postulates. Part of the problem with using PRA analysis is that to compare results from operating reactors to those from decommissioning reactors, there must be consistency in the methods used. As an example, the technical basis within NUREG-1738 "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Plants" revolves around relative risk levels associated with postulated accidents. While the study demonstrates that the risks are of a low probability, the risks are not zero and therefore the potential for off-site exposures exists and should not be ignored. Some of the postulated accidents have off-site radiation exposures that are considered significant but have been ignored because they are of such a low probability for occurrence. In particular, NUREG-1738 states: "For comparison, at operating reactors, additional risk-significant accidents for which EP is expected to provide dose saving are in the order of 1E-05 per year, while for decommissioning facilities, the largest contributor for which EP will provide dose savings is about 2 orders of magnitude lower (cask drop sequence at 2E-07 per year)." This analysis in NUREG-1738 for operating reactors was based on results from NUREG-1150 "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants". While no direct comparisons using SOARCA probabilities are available, it would be expected that the dose savings may be comparable to the 2E-07 per year figure quoted for a decommissioning facility. The point to be made here is that if NUREG-1738 had used SOARCA as a basis for operating reactors versus NUREG-1150, the consequences of an operating reactor versus a decommissioning reactor would have been even smaller. Also, as stated in NUREG-1738 and quoted in the Draft Regulatory Basis Document: "the risk at decommissioning plants are low and well within the commission's safety goals; the risk is low because of the very low likelihood of a zirconium fire even though the consequences of a zirconium fire could be serious"; SOARCA demonstrates that the risk of a serious reactor accident is also well within the commission's safety goals. The accidents analyzed in SOARCA are also selected because of the significance consequences that could result.

In NUREG-2161, "Consequence Study of a Beyond-Design Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor", the following statement from page 253 number 9 is made, "For all scenarios, no offsite early fatalities attributable to acute radiation exposure are predicted to occur." When necessary, emergency response as treated in this study effectively prevents early fatalities from acute

radiation exposure. In addition, on the same page number 10 has the following statement, “In both high and low density loading without successful deployment of mitigation, the individual latent cancer fatality risk within 10 miles for the studied scenarios is predicted to be on the order of 1E-10 to 1E-11 per year, based on the linear no threshold dose response model”. This is contrasted to the SOARCA results. On page 75, the following quote is made “Scenario specific risk of an LCF for an individual within 10 miles of the plant is on the order of 1E-09 to 1E-11 per reactor year.” Therefore, it can be seen that a severe accident affecting the spent fuel pool has comparable risk to that for an operating reactor. In both NUREG-2161 and SOARCA, these consequence results are based on effective emergency response actions. The maintenance of an off-site emergency response plan ensures that immediate and effective measures can be implemented to protect the public and reduce or avoid unnecessary exposures. The existence of a plan provides the public a baseline assurance that the respective government response agencies and the licensee are prepared for a worst case scenario. If the risk of public exposure exists, then plans should remain in place to address that portion of the population as effectively as possible.

As expressed by former Chairman Allison Macfarlane in response to Kewaunee Station’s exemption request, until adequate analysis is presented warranting that a spent fuel pool zirconium fire resulting in an off-site release is no longer possible, the licensee should retain some limited pre-planned off-site response capabilities. This would necessitate retaining the capability for a licensee to perform dose assessments and provide PARs to off-site officials. At the same time, it would require that off-site response organizations retain their emergency response organization to implement any necessary protective actions for the public. HS/ER-5 agrees with this assessment.

HS/ER-5 believes a community advisory board is a very important concept. All licensees tend to be different and some may embrace and actively seek community involvement voluntarily and outside of a requirement while others will continuously avoid such involvement and want to just walk away leaving some necessary stakeholders out of it.

Comments Related to Specific Elements of the Emergency Plan

Staffing and Emergency Response Organization

HS/ER-5 is in basic agreement with the proposed basis for emergency response organization staffing for the various Levels of the decommissioning process.

Emergency Action Levels and Emergency Classification Levels

HS/ER-5 does have comments on the proposed classification levels and emergency action levels that would be possible in Level 1 and Level 2. Most of the comments we have in Level 1 are related to some of the proposed guidance in NEI-99-01 Rev 6. As these comments are more site-specific, we will not be providing them in response to generic rulemaking. HS/ER-5’s comments in Level 2 relate to the fact that the NRC feels that it is not necessary to have an emergency classification level higher than Alert. As stated, on page A-19 of the Draft Regulatory Basis Document, “In Level 2, the probability of a condition reaching the level above emergency classification of Alert is very low.” This philosophy would seem to be inconsistent with the philosophy used for operating reactors. Evidence of this, is the fact that a General Emergency has not been declared since TMI. Therefore, it is obvious that the probability of an operating reactor ever declaring a General Emergency is low nevertheless this does not negate the need to keep this classification level. In summary, HS/ER-5 believes that the NRC is not justified in removing these classifications levels as long as there is a finite probability of reaching this classification level.

Evacuation Time Estimate Studies

HS/ER-5 is in agreement that once a reactor enters into decommissioning, it is not necessary to update evacuation time estimates.

Annual Dissemination of Public Information

HS/ER-5 is in basic agreement that once Level 2 is reached in the decommissioning process, there is no further need to disseminate public information brochures.

Drill and Exercise Program

HS/ER-5 is in basic agreement with the NRC that clarification is needed to, not only NRC regulations, but also FEMA regulations in 44CFR350 to clarify the timing and scope of exercise and drill requirements for decommissioning reactors. That being said, HS/ER-5 also agrees that the risk is reduced and the need to do a full-scale exercise is no longer required after Level 2 is met.

Hostile Action Requirements

HS/ER-5 agrees with the NRC that once Level 2 has been reached, the HAB requirements can be relaxed. HS/ER-5 strongly agrees with the plan to eliminate HAB exercises once a reactor enters the decommissioning process.

Emergency Response Data System

HS/ER-5 appreciates that the NRC spells out in this Draft Regulatory Basis Document that some OROs may have agreements with the utilities and that, because of this, these licensees shall continue to provide this information to the ORO throughout the decommissioning process.

Off-Site Radiological Emergency Response Plans

HS/ER-5 takes exception to the NRC position that once a minimum of 10 hours is available to take appropriate response actions off-site, formal radiological off-site emergency plans are not necessary. As stated previously, HS/ER-5 strongly believes that even though the risk is less, the need for specialized plans as opposed to all-hazard plans, continues to exist well into Level 2. What this means, is that additional measures beyond all-hazard plans will be required and maintained to adequately ensure public health and safety in the remote but finite hazard that continues to exist beyond the typical all-hazard emergency plan.

Notification Requirement to State and Local Government Agencies

HS/ER-5 is in basic agreement with the change to a 60-minute requirement for off-site notification. It is suggested that the words be changed to “notify as soon as possible but not later than 60 minutes following the emergency classification”.

Public Alert and Notification Systems

HS/ER-5 agrees that there is no need to maintain a public alert notification system once Level 2 has been entered.

Off-Site Radiological Protective Action Recommendations

As mentioned previously, HS/ER-5 feels that there need to be a plan in place for the small but finite probability that protective action recommendations may be needed.

Conclusion

A rule on decommissioning should not be based solely on risk-informed decision making. Our comments recognize the importance to maintain a degree of emergency preparedness as an integral part of the NRC's overall safety philosophy using Defense-in-Depth. Additionally, HS/ER-5 feels State involvement is vitally important to the decommissioning process.

The CRCPD appreciates the opportunity to comment on this important document. If you have any questions, please feel free to contact Ken Evans at (217) 785-9912 or via e-mail at Ken.Evans@Illinois.gov.