NRC INFORMATION BRIEFING ON EMERGENCY PREPAREDNESS
May 3, 2011

Comments of Riverkeeper, Inc.

On May 18, 2009 the Nuclear Regulatory Commission issued a proposed rule propounding certain "Enhancements to Emergency Preparedness Regulations."[1] Riverkeeper, Inc.,[2] reviewed this rule and submitted detailed comments in response.[3] The staff of the NRC has now issued a proposed final rule, and the Commissioners seek information and stakeholder feedback prior to voting on the final rule.

Riverkeeper's initial comments on NRC's proposed rule identified a critical overarching concern: the proposed changes to the regulations did not alter the procedural nature of the existing emergency preparedness regulatory scheme. This fundamental flaw divorces emergency planning from reality and makes it impossible to measure the actual effectiveness of a nuclear plant's emergency plan. Thus, Riverkeeper advocated that the NRC implement a performance-based approach that sets benchmarks for determining what constitutes a workable plan sufficient to meet the "reasonable assurance" standard of 10 C.F.R. § 50.47(a)(1). Additionally, Riverkeeper's initial comments criticized various of the proposed changes for failing to require licensees to consider and prepare for "the worst," i.e., what could possibly and credibly occur at a U.S. nuclear plant.

The NRC staff has largely rejected Riverkeeper's concerns and suggestions, and, as a result, the proposed final rule continues to be glaringly inadequate. Riverkeeper offers the following specific comments in response to the proposed final rule for the Commission's consideration prior to the Commissioners' formal votes on whether to approve the rule.

Emergency Preparedness Regulations Must Prepare Licensees For "The Worst"

Nuclear power plant licensees must be capable of implementing an effective evacuation plan under all ***possible*** circumstances and contingencies. Failing to prepare for "the worst" defies any sense of logic and common sense, and only serves to put the communities surrounding nuclear

[1] Nuclear Regulatory Commission, Enhancements to Emergency Preparedness Regulations, Proposed Rule, 10 C.F.R. Parts 50 and 52, RIN 3150—AI10, NRC-2008-0122, 74 Fed. Reg. 23254 (May 18, 2009) (hereinafter "May 2009 Proposed EP Rule").
[2] Riverkeeper, Inc. is a member-supported, not-for-profit organization dedicated to protecting the Hudson River and its tributaries. Since its inception in 1966, Riverkeeper has used litigation, science, advocacy, and public education to raise and address concerns relating to the Indian Point nuclear power plant, located on the eastern bank of the Hudson River in Buchanan, NY.
[3] Riverkeeper's Comments on NRC's Proposed Enhancements to Emergency Preparedness Regulations (Oct. 19, 2009), ADAMS Accession No. ML093100215 (hereinafter "Riverkeeper's Oct. 19, 2009 Comments").

plants at unnecessary risk should an incident actually occur. This is especially critical in light of the recent catastrophic events at the Fukushima nuclear power plant, where the unforeseen, unthinkable "worst" happened. However, Riverkeeper's detailed comments on various aspects of the proposed rule in this regard were either wholly ignored or given short shrift. The proposed final rule, thus, remains flawed.

In particular:

- **NRC Staff refuses to require consideration of a 50-mile evacuation zone.** NRC Staff specifically rejected Riverkeeper's suggestion to expand the evacuation zones surrounding nuclear plants to 50 miles.[4] Despite Riverkeeper's citation to and explanation of ample evidence demonstrating the inappropriateness of artificially small 10-mile evacuation zones,[5] NRC Staff arrived at the pithy and unexplained conclusion that "[n]o basis is provided in the comment to consider expanding the evacuation zone to 50 miles."[6]

  Science and reality clearly demonstrate that basing emergency evacuations upon a 10-mile planning zone is patently inadequate at ensuring the protection of the public during any and all credible emergency scenarios.[7]

  Moreover, even if NRC Staff believed there was no basis to expand evacuation zones at the time NRC Staff was responding to the comments on the proposed emergency preparedness rule change, there is now an even stronger basis to do so in light of the nuclear disaster at Fukushima: just five days after the incident in Japan began unfolding, the U.S. Embassy in Japan, based on the assessment and recommendation of Hon. Chairman Jaczko, ordered that American citizens stay 50 miles from the Japanese reactor complex.[8] Chairman Jaczko stated that this "was based on what the commission would recommend 'in a comparable

[4] Summary of Public Comments Received on Proposed Revisions to 10 CFR Parts 50 and 52 Enhancements to Emergency Preparedness Regulations, ADAMS Accession No. ML102150147 ("Summary of Public Comments") at 95-96.

[5] Absurdly, licensees are not even required to ensure evacuation of the *entire* 10-mile emergency planning zone, but rather only a 2-mile zone and a wedge extending out to 10 miles depending on the direction of the wind (a keyhole configuration). *See* Riverkeeper's Oct. 19, 2009 Comments at 24. This is laughable in light of what is known about how far radiation can extend after an accident, especially after the recent catastrophe at Fukushima.

[6] Summary of Public Comments at 96. Failing address or even mention the issues raised in Riverkeeper's comments calls into question the integrity of this rulemaking process and the NRC's oft-stated commitment to conduct transparent public processes: inviting interested, vested stakeholders to the table to comment, but then failing to address or explain the basis for rejecting those comments renders such participation meaningless.

[7] *See, e.g.*, Riverkeeper's Oct. 19, 2009 Comments at 25-26; Edwin S. Lyman, Chernobyl on the Hudson? The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant (September 2004) ("direct exposure to the radioactive plume resulting from a terrorist attack at Indian Point could have severe consequences well beyond the 10-mile EPZ, yet there is no regulatory requirement that local authorities educate residents outside of the EPZ about these risks, or undertake emergency planning to protect these individuals from plume exposures. Therefore, individuals who are now at risk do not have the information that they may need to protect themselves.").

[8] *See* Mark McDonald & Kevin Drew, *U.S. Urges Wider No-Go Area Around Nuclear Plant*, THE NEW YORK TIMES (March 16, 2011), http://www.nytimes.com/2011/03/17/world/asia/17search.html (last visited April 26, 2011) (hereinafter "McDonald & Drew"); Jim Efstathiou Jr. & Simon Lomax, *Jaczko's Call on Fukushima Radiation Plucks U.S. Regulator From Obscurity*, BLOOMBERG (March 21, 2011), http://www.bloomberg.com/news/2011-03-21/jaczko-s-call-on-fukushima-radiation-plucks-u-s-regulator-from-obscurity.html (last visited April 26, 2011).

situation in the U.S.'"[9] Subsequently, the NRC reaffirmed its baseless confidence in the 10-mile emergency planning zones around U.S. nuclear plants, explaining, *inter alia*, that "projected radiation levels would not be expected to exceed EPA protective action dose guidelines . . . beyond 10 miles *under most accident scenarios*," and that the recommendation to Americans in Japan was based on "conservative assumptions" and an abundance of caution regarding whether radiological releases "could possibly" exceed established exposure limits.[10] This rationale reveals the critical flaw in NRC's thinking: NRC cannot simply require adequate planning and protection for "most" accidents, but for ***any*** that could occur, i.e., "the worst." Despite the fact that several major nuclear disasters have occurred at various plants around the world over the past 30+ years, the NRC is content to assume that preparedness for a large-scale meltdown catastrophe is not necessary. This is utterly nonsensical. "Conservative assumptions" must be incorporated into emergency planning at U.S. nuclear plants, just as they were in Japan, to ensure that each particular plant is ready and able to handle "the worst."

The NRC has also now stated publicly that there is supposedly a certain amount of emergency planning required for 50-mile zones around U.S. nuclear plants.[11] This is entirely belied by the instant rulemaking which reiterates the applicability of only a 10 mile zone and squarely rejects the proposal for a 50 mile zone. This position is further contradicted by statements by a local emergency planning official of Westchester County, which clarify that emergency planning in relation to Indian Point is *only* considered for the 10-mile zone.[12]

In sum, the proposed final rule improperly fails to institute a realistic, conservative emergency planning zone for nuclear plants. Requiring comprehensive planning for that portion of the population surrounding a nuclear power plant that *could* be affected by a severe accident and wide-ranging radiological release is absolutely necessary. Consideration of a 50-mile emergency planning zone would be far more appropriate than a 10-mile zone, or, at minimum, licensees should be required to perform site-specific assessments to determine what an appropriate radius would be at particular sites.

- **NRC Staff refuses to use an accurate plume transport model.** Riverkeeper's original comments on the proposed emergency preparedness rule criticized NRC Staff's Evacuation Time Estimate ("ETE") methodology for continuing to assume an overly simplistic straight-line model of plume transport.[13] NRC Staff did not alter the final rule or NUREG/CR-7002 in any way to address this concern, reasoning that "[n]o connection exists between the ETE and assessment of plume transport. These are separate analyses and although evacuation

[9] *See* McDonald & Drew, *supra* note 7.
[10] E-mail from Neil Sheehan (NRC Public Affairs Officer) to various re: "NRC statement on 10-mile-radius Emergency Planning Zones for U.S. nuclear power plants" (April 5, 2011) (emphasis added).
[11] *See, e.g., id.* ("That does not mean the protective actions could not expand beyond the 10-mile radius. Rather, emergency planners have always known such actions could be necessary if the situation warranted it. Indeed, U.S. nuclear power plants are required to consider and drill for the possibility of radiation releases that could have impacts up to 50 miles away.")
[12] *See* Statement of Tony Sutton, Commissioner of Emergency Services for Westchester County at Westchester County Board of Legislators Environment & Energy Committee (March 21, 2011, 3:00 pm), *video available at*, http://westchestercountyny.iqm2.com/Citizens/VideoMain.aspx?MeetingID=1715 (last visited April 26, 2011).
[13] *See* Riverkeeper's Oct. 19, 2009 Comments at 24.

speed may be an input to plume model, the development of the ETE is in no way related to the plume model."[14]

However, NRC Staff's response to Riverkeeper's concern is completely misleading and incorrect: NRC Staff's draft report concerning criteria for the development of ETEs (associated with the proposed emergency preparedness rule) specifically stated that "[e]vacuation areas are developed by *assuming a plume travels in a fixed wind direction*, and an ETE is calculated for all of the ERPAs within the plume sector."[15] Clearly, plume transport *is*, and indeed *must be*, a factor in developing ETEs: whether a plume will move in a predictable, straight fashion and only affect a discrete, known location, versus whether a plume moving over a more complex geography would spread less predictably and affect a far more varied sector of the population will change the time it takes to evacuate the affected public.

NRC Staff's approach is simply another clear example of NRC failing to start at the appropriate baseline from which to plan for effective emergency preparedness. Interestingly, NRC Staff has completely skirted the real issue by not responding in any way to Riverkeeper's (other others, including the New York State Attorney Generals Office) substantive comment regarding the improper use of an overly-simplistic plume transport model.[16] Having an accurate understanding of how a plume of radiation will move following an accident is absolutely essential for planning purposes, including in ETEs and otherwise. This is made all the more clear given the situation in Japan where the model used to predict the dispersal of radioactive materials was found to be useless for effectuating the emergency plan.[17]

It is imperative that NRC require licensees to develop ETEs and other aspects of their emergency plans based upon far more realistic notions of plume transport. This is a foundational issue, and the final proposed emergency preparedness rule remains fundamentally flawed for failing to address it.

- **NRC Staff refuses to consider evacuation during peak rush hours.** NRC Staff's proposed final rule would continue to allow for inaccurate, and therefore less than useful, ETEs due to unrealistic scenario development. Riverkeeper challenged NRC Staff's proposed ETE scenario development scheme for not considering scenarios during commuter rush hour traffic.[18] NRC Staff disagreed with this comment, stating that "[s]uch a scenario . .

[14] Summary of Public Comments at 96.
[15] *See* NUREG/CR XXXX, "Criteria for Development of Evacuation Time Estimate Studies," Sandia National Laboratories (Predecisional Draft, April 23, 2009).
[16] NRC Staff simply states that plume modeling is separate from ETE development, without addressing the validity of Riverkeeper's actual criticism of the plume dispersal model employed by NRC. Summary of Public Comments at 96.
[17] *See* Hidenori Tajima, *Focus: Prediction System Found Useless in Nuke Emergency, Evacuation Plans* (April 27, 2011), http://english.kyodonews.jp/news/2011/04/88030.html, last visited April 28, 2011 ("Japan's multi-billion-yen system for predicting the dispersal of radioactive materials has proven to be of not much help in the ongoing crisis at the Fukushima Daiichi nuclear power plant, drawing sharp criticism of the government of Prime Minister Naoto Kan").
[18] *See* Riverkeeper's Oct. 19, 2009 Comments at 26.

. does not necessarily provide the more challenging scenario or a longer ETE because the summer midweek daytime and winter midweek daytime scenarios would bound a rush hour scenario . . . ."[19] This is ostensibly because in daytime scenarios, workers would be located farthest from home and have to travel home first, then evacuate, whereas during rush hour, workers are already on the road and closer to home.[20]

NRC Staff's reasoning here is faulty and unpersuasive. First, it is far from clear that a rush hour scenario would not present a more challenging situation then those now assessed. In fact, it is virtually certain that an attempted evacuation during rush hour times of day would take longer than those occurring during midday: common sense alone dictates that having to commence an evacuation when critical roads are already crippled and overwhelmed by gridlock would be more difficult than instructing people and starting an evacuation when the roads are clear. Second, and more fundamental, NRC Staff has missed a crucial point raised by Riverkeeper's comment: licensees and relevant entities must be ready to face any and all possible evacuation scenarios. Despite what situation may result in a longer ETE (for example NRC Staff's alleged bounding midday scenario versus a rush hour scenario), at minimum, varying situations present different challenges that will effect how evacuation proceeds. Thus, NRC Staff should require consideration of a realistic range of scenarios during ETE development and otherwise (including rush hour situations), in order ensure that licensees will be ready for any possible contingency.

The NRC Staff's proposed final rule continues to condone unrealistic ETE scenario development. This, yet again, demonstrates NRC's failure to require preparation that accounts for all possible circumstances. As a result, the final proposed rule remains deficient.

- **NRC Staff refuses to adequately account for shadow evacuation.** NRC Staff continues to severely underestimate the amount of shadow evacuation that would occur in the event of an actual emergency. In particular, in the proposed final rule, NRC Staff affirms its position that assuming a 20% shadow evacuation extending to 15 miles from a nuclear power plant is appropriate.[21] NRC Staff states that a shadow evacuation would occur in a graded manner, with shadow evacuation decreasing with distance away from the affected area, however, a 20% value is assumed for the entire 15 miles for the sake of consistency.[22] As such, NRC Staff is confident that the 20% figure is more than enough to account for the self-evacuation phenomenon.

  However, NRC Staff is simply not recognizing reality: Academic research as well as Three Mile Island and Hurricane Rita demonstrate that shadow evacuations will be considerable and occur *well beyond 15 miles*, and as far as 50 miles.[23] ETEs and other pertinent aspects of nuclear power plant emergency plans must reflect and account for this eventuality, and, at a

[19] Summary of Public Comments at 96.
[20] *Id.*
[21] *Id.* at 95.
[22] *Id.*
[23] *See generally* Riverkeeper's Oct. 19, 2009 Comments at 26-27.

minimum, be overly conservative to ensure that licensees and relevant entities are prepared for "the worst."

- **NRC Staff is proposing to employ an improper trigger for ETE updating.** Riverkeeper commented in detail regarding the inadequacy of NRC Staff's proposed trigger for ETE updating by licensees.[24] Riverkeeper explained that changes in population density beyond the 10 mile emergency planning zone and the most populous ERPA must be considered when determining whether an ETE update is necessary, and that other indicators like traffic volume and infrastructure modifications, should be considered as well.[25] Riverkeeper further explained that site-specific review would be necessary to determine a more appropriate trigger for ETE updating at particular nuclear power plants.[26] For example, based on the existing high population density, a 5% change (not 10% as proposed) could be a more appropriate trigger for ETE updates at the Indian Point nuclear power plant.[27]

  While the NRC Staff agrees that "'one size does not fit all situations' regarding the trigger for updating ETEs," NRC Staff now proposes a trigger that is even more problematic than as originally conceived. In particular, "[t]he final rule adopts the approach of a 25 percent or 30 minute increase in ETE values to determine when an ETE analysis update is warranted."[28] This is a highly inappropriate measure for various reasons. First, as explained in detail in Riverkeeper's initial comments on the proposed rule, the ETE methodology employed by NRC is inherently flawed in several respects, thereby leading to inaccurate estimates.[29] It, thus, makes little sense to base the trigger for ETE updating upon fluctuations in ETEs unless the various threshold concerns articulated in Riverkeeper's initial comments are first addressed. Additionally, NRC Staff's new approach blatantly ignores Riverkeeper's concern regarding population increases beyond the 10-mile emergency planning zone and most highly populated ERPA. In fact, using changes in ETEs as the trigger for ETE updating would appear to only be sensitive to population changes in a very small 2 mile radius around nuclear plants and only a small wedge extending out to 10 miles (a keyhole), since this is what ETEs assess. This clearly would be inadequate to guarantee that licensees perform appropriate ETE updating.

  Based on the foregoing, NRC Staff's proposed final rule regarding ETE updating is improper. For the reasons set forth in Riverkeeper's initial comments on the proposed rule, a site-specific assessment that considers population changes, infrastructure modifications, and other indicators for more than simply the 10 mile EPZ and most populous ERPA is necessary and far more appropriate for determining when an ETE update should be triggered.[30]

- **NRC Staff refuses to require Emergency Response Organization ("ERO") personnel to**

[24] *See id.* at 21-23.
[25] *See id.*
[26] *See id.* at 22.
[27] *See id.* at 22-23.
[28] Summary of Public Comments at 93.
[29] *See* Riverkeeper's Oct. 19, 2009 Comments at 24-27.
[30] *Id.* at 21-23.

consider beyond design basis threats ("DBT") in relation to on-shift multiple responsibilities.[31] NRC Staff does not believe this is necessary since "DBT is associated with adversaries and the associated impact on special nuclear materials" and "the change in DBT will not change the physics related to the source term and core damage, even though an increase in the number of adversaries can increase the probability of reaching vital plant equipment faster. "[32]

NRC Staff provides no rational basis to ignore Riverkeeper's concern. To begin with, it is far from clear that the physics and core damage would be the same during a DBT event and a beyond DBT event (for example, the impact of a deliberate hit by a large aircraft, which is not considered in the DBT,[33] could be more severe than a DBT event). Furthermore, a beyond DBT event may likely require a different personnel response than that for a DBT event (for example, if the circumstances involve more adversaries and/or simultaneous points of attack not part of the current DBT, this will certainly warrant a different response from personnel attending to multiple responsibilities than a situation involving a more simplistic threat).[34] Thus, Riverkeeper's comments regarding on-shift multiple responsibilities are valid and must be reflected in the final rule. Once again, this is necessary to ensure that licensees are prepared for "the worst" situations plausible.

- **NRC Staff refuses to require that all licensees install backup power to primary alert and notification systems ("ANS") or to require that secondary ANSs be as timely and effective as primary systems would have been.** Riverkeeper's initial comments on NRC Staff's proposed emergency preparedness rule demonstrated amply the need for NRC to require not simply a backup ANS, but also backup power for primary systems, in order to ensure their reliability and effectiveness.[35] Riverkeeper further showed why it would also be necessary for a backup ANS to be as timely and effective as the intended primary system.[36] NRC Staff has completely rejected Riverkeeper's comments on this issue, notably without specifically addressing *any* of the reasons Riverkeeper articulated.[37]

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[31] Riverkeeper's comments on this point were focused on proposed regulation revisions concerning on-shift multiple responsibilities, *see id.* at 14-15, however, NRC Staff responded to the comment as it related to EALs. *See* Summary of Public Comments at 34. Thus, NRC Staff did not even address Riverkeeper's concern and made "no change . . . to the final rule or the guidance documents in response to this comment." *Id.*

[32] Summary of Public Comments at 34.

[33] *See* Riverkeeper's Oct. 19, 2009 Comments at 14-15.

[34] *See generally id.* (explaining how the current DBT requires a comparatively light defense for nuclear power plants and their spent fuel, and why consideration of beyond DBT is necessary in the context of ensuring adequate on-shift personnel emergency response) (citing Gordon R. Thompson, "Risk Related Impacts from Continued Operation of the Indian Point Nuclear Power Plants" (Institute for Resource and Security Studies) (November 28, 2007) at 38-40).

[35] Riverkeeper's Oct. 19, 2009 Comments at 18-19.

[36] *Id.* at 19-20. Notably, Riverkeeper's two suggestions were not "if not this, then this" as NRC Staff characterizes it, but rather two separate suggestions, both of which should be implemented. *See* Summary of Public Comments at 70; Riverkeeper's Oct. 19, 2009 Comments at 18-20.

[37] *See* Summary of Public Comments at 70. NRC Staff rejected Riverkeeper's comments by pithily referring back to its original rationale for the proposed regulation revision. This hardly demonstrates adequate consideration of valid public input. *See supra*, note 6.

For the many reasons Riverkeeper has already stated, (1) back-up power for primary ANSs and (2) backup ANSs that are equally as effective as primary systems, are both critical components of adequate emergency preparedness.[38] NRC Staff's refusal to require these simply shows how NRC Staff is not ensuring that licensees would be in the best position to be able to handle all credible and worst-case scenarios. Such an approach should not be acceptable.

- **NRC Staff refuses to require that licensees drill for rapid escalation to a General Emergency.**[39] NRC Staff is content to allow licensees to "meet the [drill] requirement by escalation to an SAE [Site Area Emergency]."[40] NRC Staff reasons that "this element will improve scenario variability and realism." Moreover, NRC Staff also refuses to require that rapidly escalating drills take place on a more regular basis than once every exercise cycle, reasoning that that "[i]n effect that rule requirement will cause many licensees to include this element in drills, even though it is not required, and that will cause it to be practiced more often than the rule itself requires."[41]

  There is a significant difference between a SAE and a GE: during a SAE, "[a]ny releases of radioactive material are not expected to exceed the EPA PAGs except near the site boundary."[42] In contrast, a GE "involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs for more than the immediate site area."[43] It makes little sense to not specifically *require* that licensees to drill for the latter situation,[44] especially in light of the recent events at Fukushima, which would have certainly triggered the highest level emergency classification (i.e. a GE) if a comparable event occurred at a U.S. nuclear plant. It is not acceptable to assume or hope that licensees would choose drills that escalate to GE involving sizeable radiological releases, and in reality, under the proposed final rule, it would remain perfectly fine if licensees never drilled for such a scenario. Moreover, scenario variability/realism and requiring at least a certain amount of drills to include rapid escalation to a GE are not mutually exclusive. It is absolutely critical that licensees drill and be prepared for the worst possible situation, which would involve a rapid escalating event to a GE. Additionally, requiring that licensees drill for rapidly escalating events more often than once an exercise cycle would be highly prudent to ensure adequate preparedness for such events. Simply

[38] *See* Riverkeeper's Oct. 19, 2009 Comments at 18-20.
[39] *See* Summary of Public Comments at 50-51, 61.
[40] *See id.* at 51, 61.
[41] *Id.*
[42] *See* U.S. Nuclear Regulatory Commission, Backgrounder on Emergency Preparedness at Nuclear Power Plants, http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/emerg-plan-prep-nuc-power-bg.html (last visited April 26, 2011).
[43] *Id.*
[44] Riverkeeper also continues to question NRC Staff's sanction of "no or minimal release scenarios" in exercises and drills. *See* Riverkeeper's Oct. 19, 2009 Comments at 11-12. NRC Staff's rejected Riverkeeper's comments on this issue because "[s]cenarios must provide the opportunity for protective action decision makers to demonstrate their ability to provide protective actions in a minimal release scenario." *See* Summary of Public Comments at 58. In any event, this same logic dictates that licensees should be required to demonstrate their ability to provide protective actions during an event involving rapid escalation to a GE, and "maximum" release scenarios. NRC Staff should not address only one end of the scenario spectrum.

assuming that licensees would do that more often than they are required to is absurd. Specific threshold criteria that would ensure that licensees account for and drill worst case scenarios are clearly preferable over NRC Staff's approach, and certainly would not preclude drill variability and realism.

- **NRC Staff refuses to require that licensees drill hostile action scenarios where fast-breaking radiological release is caused by an intentional attack on spent fuel storage facilities.**[45] NRC Staff believes this requirement is not necessary because "the final rule requires rapid escalation of an emergency and, to increase scenario variability, licensees need not specify the scenario in which that requirement is met."[46] Unfortunately, NRC Staff is once again failing to set threshold criteria under which licensees would have to demonstrate adequate preparation for worst-case scenarios. NRC Staff is satisfied because licensees *could* choose to drill for a fast-breaking radiological release caused by a terrorist attack on spent fuel storage facilities.[47] However, this is by no means guaranteed, since drills involving rapid escalation to only a SAE would be acceptable. Moreover, scenario variability would not be compromised by requiring that licensees *at some point* drill for this credible contingency. NRC Staff's proposed final rule, thus, remains too vague to guarantee that licensees are prepared for "the worst."

- **NRC Staff does not appear to require simultaneous offsite occurrences during hostile action drill scenarios.** Riverkeeper's initial comments on the proposed emergency preparedness rule advocated that licensees be required to consider various possible occurrences that would result in conjunction with a hostile event during hostile event based drills.[48] NRC Staff appears to agree with Riverkeeper's comments on this point, however only vaguely states that "[l]icensees should consider including collateral damage, such as loss of offsite power, in hostile action scenarios" and that accordingly, "[c]hanges were made to the ISG [Interim Staff Guidance] in response to this comment."[49]

  Based on this response it is not clear that, and indeed doubtful, that NRC Staff would specifically require consideration of the list of contingencies listed by Riverkeeper during hostile action event based drills. Rather, this language is permissive at best, and certainly does not guarantee that licensees will examine all appropriate offsite occurrences that could occur during hostile action. As such, NRC Staff is once again not requiring preparation for worse-case scenarios.

- **NRC Staff refuses to provide specific criteria for the scope of hostile action based drills to ensure that all relevant factors are considered.**[50] NRC Staff rejected Riverkeeper's comments suggesting such specific criteria, reasoning that "NEI developed detailed guidance for the conduct of drills and exercises in support of the hostile action drill pilot program."[51]

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[45] Summary of Public Comments at 58.
[46] *Id.*
[47] *Id.*
[48] *See* Riverkeeper's Oct. 19, 2009 Comments at 7 (suggesting consideration of shadow evacuation, simultaneous attacks resulting in loss of offsite power, multi-pronged attacks, and severely impaired critical infrastructure).
[49] Summary of Public Comments at 61.
[50] *See* Riverkeeper's Oct. 19, 2009 Comments at 5-9; Summary of Public Comments at 61.
[51] Summary of Public Comments at 61.

However, as explained at length in Riverkeeper's initial comments, specific criteria are necessary to ensure that licensees drill for all credible situations and "the worst" that could happen.[52] Providing general, vague guidance regarding what hostile action based drills could include simply does not go far enough to ensure that every credible contingency is considered. More specific standards are necessary to accomplish this, and the final proposed rule is flawed for failing to do so.

NRC Should Implement a Performance-Based Approach to Emergency Preparedness

The NRC Staff has completely failed to adequately explain and justify the rejection of Riverkeeper's comments regarding the appropriateness of a performance-based approach to emergency planning.[53] Riverkeeper's suggested approach is absolutely necessary in order to ensure the effectiveness of a nuclear plant's emergency plan, and to enable the NRC to recognize when evacuation at a particular plant would be unworkable. However, NRC Staff's proposed final rule does not alter the procedural nature of the current emergency preparedness regulatory framework in any way. The final rule is, therefore, patently deficient and effectively meaningless.

In particular:

- **NRC refuses to implement ETE performance standards.** NRC Staff's proposed final rule would continue to merely require the development of ETEs as an abstract tool to be used by relevant officials in determining "the most appropriate protective action."[54] As a largely procedural requirement, ETEs have limited effectiveness, especially in light of the numerous deficiencies with ETE methodology as discussed herein and in Riverkeeper initial comments on the proposed rule.[55] Thus, ETEs do not play a meaningful roll in emergency planning.

  As such, Riverkeeper advocated for the use of ETE standards of performance, whereby ETE studies would be used by licensees to demonstrate that evacuation under varying relevant conditions would be possible within an acceptable timeframe that would prevent unacceptable radiation exposure to the public.

  NRC Staff did not agree with this suggestion, stating that "[l]icensees are required to calculate the ETE based on site-specific characteristics and not meet specific time standard in order to be acceptable."[56] This is the precise problem: licensees do not have to demonstrate that a timely evacuation is possible, but rather only must calculate how long an evacuation would take. This is completely illogical. As the whole purpose of emergency preparedness is to ensure protection of the public in the event of an nuclear emergency, is makes absolutely no sense to not require licensee to demonstrate the feasibility of timely evacuation. As such, performance standards are appropriate, and indeed necessary.

[52] Riverkeeper's Oct. 19, 2009 Comments at 5-12.
[53] *See id.* at 2-3.
[54] May 2009 Proposed EP Rule at 23,265.
[55] Riverkeeper's Oct. 19, 2009 Comments at 24-27.
[56] Summary of Public Comments at 95; *see also id.* at 98.

Notably NRC Staff misinterpreted Riverkeeper's suggested approach: NRC Staff believes that Riverkeeper was proposing actual regular evacuations.[57] By no means did Riverkeeper suggest this or would Riverkeeper suggest this. Instead, Riverkeeper was recommending that ETEs, i.e., the studies themselves, should be required to meet performance standard aimed at ensuring that evacuations can occur by a certain time such that the public is adequately protected from radiation exposure. For example, a standard stating that an ETE, using proper assumptions and methodology, must demonstrate that evacuation of the 2-mile EPZ can occur with x hours of an evacuation order (i.e., however many hours/minutes before unacceptable exposure would occur, under varying release scenarios).[58] Without such demonstrations, a plant's emergency plan should not be approved.

- **NRC Staff refuses to implement specific, enforceable, performance-based standards to ensure licensee coordination with Offsite Response Organizations (OROs) during hostile action events.**[59] NRC Staff disagrees with Riverkeeper on this point because "[t]he criteria for all of the demonstrable activities by OROs are outside of the NRC's authority."[60]

  This reasoning makes little sense, since NRC Staff's proposed rule revision specifically requires that licensees "*ensure*" that ORO resources are available to respond to an emergency involving a hostile action event.[61] If NRC Staff is of the opinion that ORO capabilities are outside the scope of NRC's authority, this simply demonstrates how meaningless this revision to the existing regulations is. While NRC may not have authority over OROs like fire departments, police stations and hospitals, NRC could certainly set enforceable criteria for *licensees* to meet in order to effectuate the intended revision here (i.e. standards whereby licensees must show adequate coordination with OROs, availability of OROs, etc, during hostile actions).[62] Clearly, this is necessary in light of NRC Staff's response to Riverkeeper concern on this issue.

- **NRC Staff refuses to use a performance criterion for emergency declaration timeliness.** NRC Staff continues to reason that a "capability criterion" is preferable because it is would give licensees "flexibility to exceed the criterion during extenuating circumstances when emergency declarations may need to be delayed in the interest of performing unanticipated plant operations that are urgently needed to protect public health and safety."[63]

  However, implementing performance standards would not "have an adverse impact on reactor safety by keeping operators from performing needed actions to prevent further deterioration of the plant conditions."[64] Instead, it would simply hold licensees to

[57] *Id.* at 95 ("Requiring licensees to perform regular evacuations would needlessly place the public at risk and therefore should not be required. A clarification was made to NUREG/CR-7002 in response to this comment").
[58] *See generally* Riverkeeper's Oct. 19, 2009 Comments at 27.
[59] *See* Summary of Public Comments at 40.
[60] *Id.*
[61] *See* Riverkeeper's Oct. 19, 2009 Comments at 15 (citing May 2009 Proposed EP Rule at 23,284) (emphasis added).
[62] *See generally id.* at 15-16 (citing various examples of performance standards that would be appropriate to ensure adequate ORO capabilities during hostile action events).
[63] Summary of Public Comments at 78.
[64] *Id.*

measureable standards. NRC Staff's concern could be alleviated by simply also setting performance based standards for situations involving "extenuating circumstances" (in addition to a performance based standard in relation to the 15-minute declaration threshold). The point is that NRC Staff's regulation regarding emergency declaration timeliness would be far more useful if it were based upon actual performance.

- **NRC refuses to incorporate performance based standards into drill requirements.** NRC Staff explains how "[t]he NRC inspects each licensee's critique of its exercise rather than each licensee's performance in the exercise. When the licensee's performance fails to satisfy the requirements, NRC regulations require the licensee to identify the performance weakness and take corrective action."[65] This explanation fails to demonstrate that NRC Staff's approach is preferable to the performance based approach advocated for in detail by Riverkeeper.[66] Indeed, requiring licensees to comply with concrete standards based on actual performance would do a far superior job at ensuring the effectiveness of drills and at guaranteeing that licensees have all necessary capabilities for handling all relevant emergency situations.

- **NRC Staff refuses to institute any performance standards in the final proposed rule.** Riverkeeper's initial comments on NRC Staff's proposed rule advocated that NRC's emergency preparedness regulatory scheme should employ performance standards.[67] Riverkeeper also proposed specific performance-based approaches in relation to the particular proposed regulation changes.[68] NRC Staff rejected all of Riverkeeper's specific suggestions, and further generally stated that "NRC considers this comment to be beyond the scope of this rule. This rulemaking was not intended to replace the current regulatory scheme with a completely new program. However, the NRC is beginning work on technical bases to develop a more risk-informed regulatory oversight process that may address some of the commenters' concerns."[69]

  Riverkeeper does believe that the current regulatory scheme is inadequate at ensuring effective, adequate emergency preparedness at nuclear plants. Riverkeeper, therefore, sees no reason why the NRC Staff should not consider this in the instant rulemaking, while it is already undergoing a review and assessment of the existing regulations. For example, NRC Staff should simply incorporate its work on risk-informed oversight as it bears upon the relevant issues, now, and not at some intangible point in the future. Moreover, Riverkeeper suggested discrete areas where performance standards could (and should) be employed as they related specifically to the proposed revisions. Riverkeeper, thus, fails to see how such suggestions would fall outside the scope of the proposed rule.

[65] *Id.* at 61.
[66] Riverkeeper's Oct. 19, 2009 Comments at 12-13.
[67] *See* Riverkeeper's Oct. 19, 2009 Comments at 2-3.
[68] *See id.* at 12-13, 20, 27, 28.
[69] Summary of Public Comments at 138.

Other Recommendations

- **NRC Staff should fully consider the lessons of the Fukushima disaster prior to finalizing changes to NRC's emergency preparedness regulations.**

  As discussed in various of the comments articulated above, the nuclear catastrophe at the Fukushima nuclear plant in Japan has clearly demonstrated the need for improvements to the U.S. emergency preparedness regulatory scheme. NRC can no longer be satisfied that licensees would be prepared for "most scenarios." Instead, licensees must be prepared for any and all situations that could occur, i.e., the "unthinkable" worst-case scenarios. Such worst-case scenarios are not abstract or theoretical, and absolutely warrant attention and consideration.

  It is illogical to proceed with the instant rulemaking, which is specifically targeted at implementing "enhancements" to NRC's emergency preparedness regulations, without incorporating the lessons from Fukushima.[70] The situation in Japan has taught the world that incidents at nuclear facilities can occur at any time, and are completely unpredictable. It is, thus, imperative that NRC alter the current regulations appropriately as soon as possible. The instant rulemaking provides a timely and suitable vehicle in which to do so.[71]

  Thus, Riverkeeper respectfully requests the NRC to hold any final decision on the instant rulemaking in abeyance pending incorporation of lessons learned from Fukushima.

- **NRC should allow emergency preparedness to be considered as part of nuclear power plant license renewal proceedings.**

  The capability of a nuclear plant to execute effective emergency planning is directly relevant to the question of whether such a plant should be allowed to operate for an extended licensing term. For example, whether a plant has adequate emergency preparedness in light of threats and situations not previously considered should weigh directly upon whether continued operation of the plant is appropriate.

  However, it is apparent from NRC's regulations that once NRC makes a "reasonable assurance" determination at the time an initial operating license is issued, no such determination must be made at any other point during the life of the plant.[72] After decades of operating, circumstance at a nuclear plant will almost certainly have changed, and at the time of license renewal, ascertaining whether there is still the requisite "reasonable assurance" is

[70] NRC should not only consider the conclusions of the NRC's task force assigned to the matter, but also input from interested stakeholders and the public.

[71] The instant rulemaking itself largely stems from the aftermath of the September 11th terrorist attacks; the NRC began reviewing its emergency preparedness regulations in 2004 with the goal of incorporating appropriate changes in light of that tragedy, and so the process has been ongoing for quite a number of years. *See* SECY-11-0053 - Enclosure 3 - Federal Register Notice - Enhancement to Emergency Preparedness Regulations, ADAMS Accession No. ML102150169, at 3-5. Given the dire urgency with which the glaring defects with NRC's existing regulatory structure must be fixed in light of Fukushima, NRC cannot afford to take 10 years to process and complete another rulemaking.

[72] *See* 10 C.F.R. § 50.47(a).

appropriate, and indeed, necessary. For example, at plants where population has exploded since initial licensing, the ability of the plant to ensure an adequate evacuation may be questionable, and so a review of compliance with the "reasonable assurance" standard in the context of a license renewal proceeding would be prudent.

In sum, there is no reason to preclude the issue of emergency preparedness from review during license renewal proceedings and Riverkeeper respectfully requests NRC to no longer do so.

Indian Point

The case of Indian Point clearly demonstrates why the regulatory changes suggested herein and in Riverkeeper's initial comments on NRC Staff's proposed emergency preparedness rule are so critical and necessary: if all credible, worst-case scenarios were to be considered, and performance standards were in place to actually measure Entergy's ability to be able to protect the public during such scenarios, it is dubious that Indian Point would be allowed to continue to operate.

That is, given the severely high population density surrounding Indian Point (approximately 20 million people within a 50 mile radius), the unique nature of the regional road system, impossible traffic congestion, limited hospital and other response organization resources, and other stark realities, it would be impossible to adequately protect the public surrounding the plant in the event of a serious emergency. This has been corroborated again and again,[73] and yet, because of the procedural nature of the existing regulatory scheme, these issues are never meaningfully addressed.

The NRC must face reality, i.e. the worst that could possibly happen at a U.S. nuclear power plant, and plan accordingly. Requiring emergency planning for only a narrow set of circumstances simply avoids the very real possibility having to deal with the worst imaginable situation. Nuclear power plants should not be allowed to operate unless they are equipped and able such situations, and the regulations must be revised to be able to measure and assess this.

[73] The 2003 "Witt Report," a study of Indian Point's emergency plan by James Lee Witt & Associates commissioned by New York Governor George Pataki concluded that the plan would not adequately protect the public in the event of an actual emergency. James Lee Witt Associates, LLC, Review of Emergency Preparedness of Areas Adjacent to Indian Point and Millstone (2003). Moreover, three of the four counties that make up Indian Point's EPZ and the New York State Emergency Management Office ("NY SEMO") refused to submit the Annual Certification Letter since 2003, citing serious doubts about its effectiveness. Despite Witt's findings and the utter lack of confidence in the plans by regional and state government officials, FEMA and NRC have subsequently approved the emergency plan every year since.