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Regulatory Improvements for Power Reactors Transitioning to Decommissioning

Comment On: NRC-2015-0070-0178

Regulatory Improvements for Power Reactors Transitioning to Decommissioning; Request for Comment on Draft Regulatory Basis

Document: NRC-2015-0070-DRAFT-0208

Comment on FR Doc # 2017-05141

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General Comment

Please find attached by comments re: Regulatory Improvements for Power Reactors Transitioning to Decommissioning.

Attachments

DavidAgnewCommentToNRC_170613

Docket ID NRC-2015-0070

June 13, 2017

Comments re: NRC -2015-0070: PROPOSED *REGULATORY IMPROVEMENTS*
FOR DECOMMISSIONING POWER REACTORS.

I, David Agnew, am a resident of Harwich, Cape Cod, MA, approximately 30 miles downwind of the Pilgrim Nuclear Power Station and its Mark I "containment". I began following the nuclear industry prior to the Three Mile Island meltdown and continue to do so. The Massachusetts Emergency Management Agency's official plan for the Cape is "shelter in place" because in the event of a severe accident, at least one of the two bridges off-cape would be closed, and in all likelihood both bridges. "Sheltering in place" means virtually no shelter given that nearly all homes are wood frame construction and there are almost no concrete shelters. Aside from restricting egress, the only active role of the official emergency managers for Cape Cod is to remove (forcibly if necessary) the inhabitants of highly contaminated areas and kill the pets. **In the event of a severe accident at Pilgrim, there is no escape from the Cape and no real emergency plan.** The NRC and our Governor think this is an acceptable plan; nearly everyone on Cape Cod does not.

I fully endorse Pilgrim Watch's NRC-2015-0070 comments, for which I am grateful. This is my "Cliff Notes" version of those comments.

The NRC's proposed "improvements" reduce or eliminate licensees' public health and safety requirements while there is still radioactive nuclear fuel in the reactor or in the spent fuel pool. Regarding the pool, this could be for as long as fifty years after plant closure; regarding the on-site dry casks, perhaps several hundreds of years (or 'forever').

Based on erroneous assumptions, and relies on flawed NRC documents, secret studies and industry guidance, the NRC's draft states, "there are no possible design-basis events at a decommissioning licensee's facility that could result in an offsite radiological release exceeding the limits established by the EPA's early-phase protective action guidelines of 1 rem at the exclusion area boundary." Essentially, the NRC is saying: Spent fuel pool fire? Can't happen. Canister drop? Can't happen. Radioactive release from a dry cask? Can't happen.

Thus the NRC justifies exemptions to offsite emergency planning and reduction in liability insurance, security and testing workers for drugs, alcohol and fatigue in order to ensure industry profitability by ignoring extremely high consequence events.

SPENT FUEL POOL FIRE

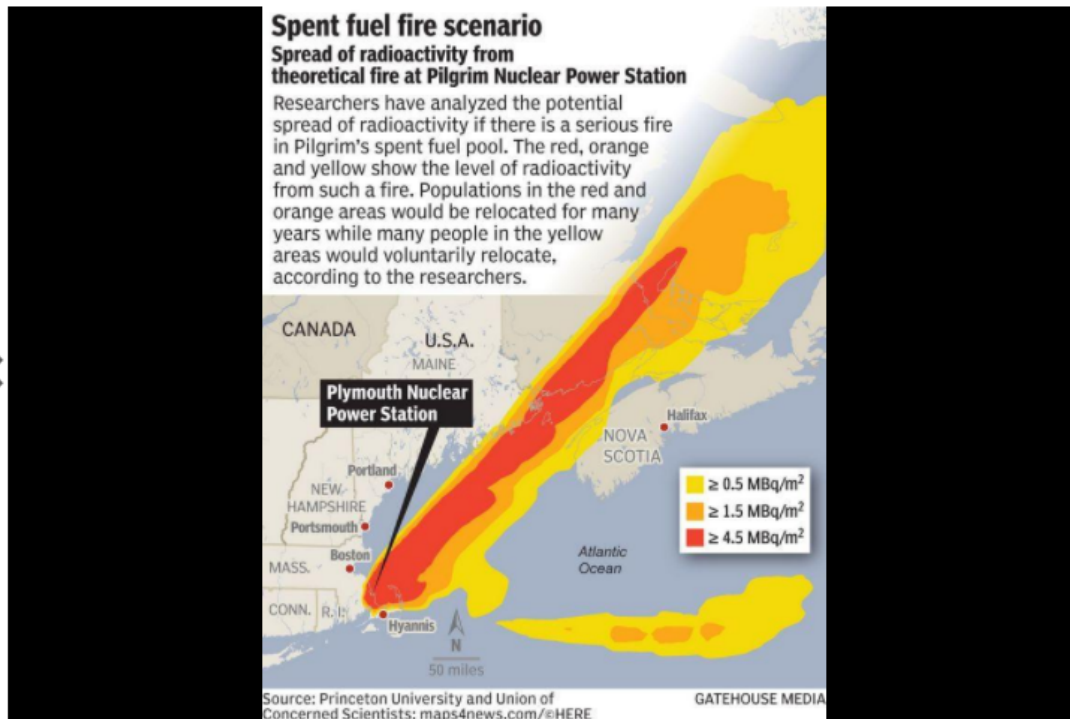
A fire in any of the 90 U.S. nuclear reactors' densely-packed spent fuel pools could release considerably more radiation than the 2011 reactor meltdowns at Fukushima Daiichi, according to recent work by Edwin Lyman (Union of Concerned Scientists) and Princeton University researchers Michael Schoeppner and Frank von Hippel.

A major fire could force the evacuation of millions dwarfing the accident at Fukushima and resulting in trillion dollar consequences.

The NRC's 2013 Peach Bottom study did not evaluate the risk of terrorism or insider sabotage as it considered spent-fuel pool safety; nor did it consider the consequences of property contamination more than 50 miles from the reactor site. Also, the NRC used outmoded statistical estimates for the value of human life; did not incorporate tourism loses after an accident, or consider the economic costs if a major accident forced multiple reactors to be shut down.

The researchers assumed a release of 1600 petabecquerels of Cs-137, the average amount that the NRC estimates would be released from a fire at a densely-packed pool. This is approximately 100 times the amount of Cs-137 spewed at Fukushima.

Fire danger in nuclear pools underestimated, scientists say



Here's an illustration, as reported by my local paper, the Cape Cod Times, assuming wind from the southwest:

There is no credible support for the NRC not to require offsite emergency planning; to allow reducing already absurdly minimal liability insurance; to relax security requirements, aging and fatigue management; to allow licensees to continue to operate and at the same time postpone implementing post Fukushima license requirements while fuel is in the pool.

Because the risk is not zero when all spent fuel is in dry casks, emergency planning, security requirements, liability insurance, and other measures can be lessened but not eliminated.

EXEMPTIONS GRANTED TO SOUTHERN CALIFORNIA EDISON

On May 17, 2017 Public Watchdogs unleashed a [chronological 450-page report](#) and analysis of regulatory failure and deeply flawed safety planning and emergency response plans at the now-closed San Onofre Nuclear Generating Station (SONGS) owned by Southern California Edison (SCE). In the event of a worst-case scenario, SCE is no longer obligated to notify the public with 15 minutes as required by law.

The report argues that the exemptions granted to SCE by the NRC are so recklessly interpreted by regulators that they violate the public safety and national security intentions of the 1954 Atomic Energy Act. It further reports that the budgets for the Federal Emergency Management Agency and the California Office of Emergency Services have been terminated relevant to SONGS, and that neither agency will respond, placing the responsibility for planning evacuations and emergency response in the hands of small local governments. In the event of a worst-case scenario, the only offsite emergency responders will be local police and fire departments. This at a site with 3.6 million pounds of plutonium-laced fuel assemblies with a radiation payload that is the equivalent of 700 nuclear warheads.

And a risk analysis released later by nuclear physicist Paul Frey showed that a conservatively estimated worst case scenario at SONGS could unleash more than 40 times the radiation released at Chernobyl with the potential of irradiating much of the Western United States.

CLEANUP STANDARDS AND THE BEIR VII REPORT

The purpose of decommissioning is the safe removal of the facility and reduction of residual radioactivity to a level that permits termination of the NRC license. To protect the public and workers the cleanup standard must be based on recent and credible scientific information. It is not and that is unacceptable.

NRC's radiation cleanup standard allows 25 millirem per year total effective dose equivalent to an average member of the critical group - limit includes the dose from drinking groundwater for a site released for unrestricted use and 100 or 500 millirem for restricted use. These limits are too high and are unsupported by recent research. Vermont and New York have a 10 millirem standard.

The NRC's cleanup standard should be based on protecting the most vulnerable population, fetus, young children, and females rather than, as now, a healthy young Caucasian male. The National Academy of Sciences (NAS) [BEIR VII Report](#) on radiation risk clearly states that no amount of radiation is safe and women and children are the most at risk and most in need of protection.

The report also notes that "no reason to believe that humans would be immune" to harm to offspring from radiation exposure to parents, and that this should be of concern to nuclear worker's families. Therefore the standard for unrestricted use should apply also for restricted sites to protect workers.

LICENSEES SHOULD HAVE A FULLY FUNDED DECOMMISSIONING TRUST FUND UPON CLOSURE

The NRC incorrectly assumes that over time, perhaps up to 60 years, the funds required for cleanup would accumulate through investments. However cost increases to accomplish cleanup accelerate faster than investments. Merchant reactors have no rate base to subsidize inadequate financial planning and there is no surety that the corporation responsible for cleanup will exist in 60 years. When LLC-owned reactors run out of money, the owner will leave the citizens 'holding the bag'.

Flaws in NRC's DTF Calculation

1. Site Specific Funding Formula: the formula is not site-specific; it simply uses the size and type of the reactor (BWR or PWR) to determine a base amount, and then applies an escalation factor based on the Department of Labor regional data for labor and energy costs. The inaccuracy of generic cost formulas is borne out of the International Atomic Energy Agency's estimate that such a formula can only provide accuracy within 30-50% of the actual cost.

2. Characterization of site contamination: The presence of subsurface site contamination will greatly increase the cost of decommissioning and site restoration. Decommissioning costs at Yankee Rowe reactor in Western Massachusetts ballooned from an “initial estimate of \$120 million to more than \$750 million, in large part the result of the spread of groundwater contamination, which had evidently been optimistic, unrealistic, and under-investigated. Connecticut ratepayers had to pay a \$480 million shortfall for cleanup of CT Yankee. A similar shortfall at Pilgrim is likely. Currently, monitoring wells show tritium leaks at Pilgrim, and the source of the tritium remains unknown. Onsite contamination also resulted from Pilgrim opening with defective fuel and no off-gas treatment system, and from an accident in 1982 where they blew its filters.

3. When to Assess Site Characterization: To assure that sufficient funds shall be available, a new assessment should be required at the beginning of the decommissioning process. Currently, if the licensee has addressed site-specific decommissioning activities in previous environmental analyses, it can postpone a new site analysis at least two years before license termination. Waiting to the end allows contamination to further migrate and risks that most of the decommission funds will have been spent, transferring mitigation costs to taxpayers.

4. The entire NRC DTF calculation is a completely unreliable basis for determining what decommissioning will actually cost.

Fund Growth and Decommissioning Cost Inflation: The NRC’s decommissioning funding program assumes financial investments will consistently produce 5% profit each year and that construction costs will increase conveniently by only 3% a year. Neither assumption is valid, therefore costs will exceed increases and the fund will steadily decrease.

Real Growth Rate: NRC 10 CFR 50.75 (e)(ii) requires a licensee’s DTF to meet a 2% real growth rate; and NRC and industry incorrectly assume that investment markets will provide a constant 2% annual real growth above inflation. However, over the 100- year period from 1910 to 2009 annualized real growth in the Dow Jones Industrial Average amounted to only 1.76%.¹ NRC staff conducted several analogous analyses and concluded that the market has experienced several decades-long periods in which real growth fell below 2%. The recent relative recovery of decommissioning funds after the economic crisis does not prove the viability of the funding assumption; the recent market crisis showed that large market events occur and they are difficult to predict. The consequence of missing the mark can lengthen the time a contaminated site remains in Plymouth and a shift of costs to the state and taxpayers.

- i. **Inflation:** The NRC assumes that the cost to decommission will increase only by 3% annually. However, even Entergy acknowledges that a small error in its own 3% to 3.5% current assumption can dramatically alter future decommissioning costs, and that even a 0.5% underestimation of decommissioning costs will lead to a 20%-25% shortfall when a plant is decommissioned.¹ Entergy's estimated costs to decommission Vermont Yankee increased by 70% between 2007 and 2014. Per the founder of the Entergy subsidiary that makes all of Entergy's cost estimates, any change in the assumption about growth of costs greatly compound errors in initial "site-specific" estimates of decommissioning costs which at their best can only predict costs within 20%.
- ii. Any error in either the assumed fund growth rate or the assumed inflation rate will magnify any error in the other, and likely will leave the fund far short of what is needed, requiring taxpayers to shoulder a significant part of the costs.
- iii. The Government Accounting Office (GAO) 2012 report, [Nuclear Regulation: NRC's Oversight of Nuclear Power Reactors](#) examined NRC's estimates of decommissioning and concluded that the NRC is inaccurately estimating the costs of decommissioning and inadequately ensuring that owners are financially planning for the shutdown of these plants. The key findings of the GAO report included:
 - The NRC's decommissioning funding formula is likely outdated; it was last updated in 1988 and is based on two studies published in 1978 and 1980.
 - The NRC's evaluation of licensees' funding arrangements was not rigorous enough to ensure that decommissioning funds would be adequate.
 - The NRC had not established criteria for acting if it determines that a licensee is not accumulating adequate decommissioning funds.
 - The NRC relies on licensees' reports of decommissioning fund balances without verification.
 - The NRC's definition and use of the word "decommissioning" does not include "spent fuel management, site restoration, and other costs not related to decommissioning"

NRC DTF calculations do not include any costs of management or site restoration when determining how much money should be in the required "decommissioning" fund.

An example: Per Entergy, the NRC's 2014 Decommissioning Trust Fund Minimal Financial Assurance Estimate for Pilgrim was \$628,139,915.00. For Vermont Yankee, it was 622,775,764. These NRC requirements fall far short of even Entergy's decommissioning cost estimates.

- For Vermont Yankee, the NRC's \$740.52 million 2015 "minimum financial assurance" estimate is about one-half of the \$1.243 billion that Entergy's 2014 estimate for the cost to decommission VY.
- For Pilgrim, the NRC's \$624.20 million 2015 "minimum financial assurance" is about \$300 million less than what Entergy estimated in 2008 that it would cost to decommission Pilgrim IF Pilgrim had closed in 2012 per its original license.

Recommendations for the NRC's DTF Calculations

1. **Cash flow analyses every 5 Years** - We urge the Nuclear Regulatory Commission to rewrite 10 CFR §50.75 to require a cash flow analysis at consecutive five-year intervals leading up to the ultimate decommissioning of the reactor. This cash flow analysis will provide policymakers with adequate information to determine when a nuclear plant will have the cash available to complete a decommissioning project.
2. **Prohibit licensee from raiding the DTF** - Limit use funds to radiological cleanup: Entergy may "raid" whatever it has in its decommissioning fund to meet expenses that have nothing to do with cleaning-up Pilgrim. Entergy's Vermont DTF is inadequate to decommission Vermont Yankee. Even so, Entergy wants to use the Vermont Yankee's DTF to pay \$600,000 in local taxes; to pay security costs to guard the spent fuel on site through 2050's; to pay for the transfer of the spent fuel from the pool to dry casks; and to pay for worker retirement costs. Massachusetts must assume that Entergy will try to do the same thing with respect to Pilgrim's DTF fund, and to do so will further diminish a fund that is already insufficient.
3. **Shorten SAFSTOR Period:** - A prolonged SAFSTOR period all but guarantees that the licensee will run out of money and taxpayers in deregulated electric markets and ratepayers in utility markets will get stuck with the bill. This is because the costs to decommission escalate at a higher percent than investment returns.
4. **Limited Liability Merchant Plants** – NRC's regulations have not, but must, consider what the **Synapse Report: Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-Tiered Holding Companies to Own Nuclear Plants**¹ describes:

¹ Synapse: Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-Tiered Holding Companies to Own Nuclear Plants, See pp 2, 30-31

Pilgrim, for example, is an LLC with no significant assets beyond a single power plant – a plant that will have negative value when Pilgrim stops generating electricity. Because Entergy chose this LLC structure, it hopes to enjoy all the benefits of Pilgrim’s profits, while at the same time avoiding Pilgrim’s responsibilities and liabilities.

Over the last ten years, the ownership of an increasing number of nuclear power plants has been transferred to a relatively small number of very large corporations. These large corporations have adopted business structures that create separate limited liability subsidiaries for each nuclear plant, and in several instances, separate operating and ownership entities that provide additional liability buffers between the nuclear plant and its ultimate owners. The limited liability structures being utilized are effective mechanisms for transferring profits to the parent/owner while avoiding tax payments.

They also provide a financial shield for the parent/owner if an accident, equipment failure, safety upgrade, or unusual maintenance need at one plant creates a large, unanticipated cost. The parent/owner can walk away, by declaring bankruptcy for that separate entity, without jeopardizing its other nuclear and non-nuclear investments. (Emphasis added)

* * *

As mentioned earlier in this Report, the multiple layers of subsidiaries, including LLCs that have been created by parent corporations in the nuclear industry are a cause of serious concern. Even if a court concludes that the liability of the subsidiary that actually operates the nuclear plant should be extended to business structures above it (for example, if under capitalization and profit distributions have left the subsidiary unable to cover the costs of unanticipated repairs or security improvements and the subsidiary decides to cease operations), the ability of the court to find a senior business entity with sufficient capital could be complicated by multiple layers of subsidiaries and LLCs.

Given that the presumption in every state and federal statute is for the limitation of corporate liability, the burden is always on the party trying to extend that liability to show that the law, facts, and public policy all support violating the statutory presumption. Courts, in general, are reluctant to pierce

the corporate veil and extend liability; when multiple corporations are involved, that reluctance only increases.

Massachusetts, nor any other state, cannot take the risk of millions of dollars of taxpayer expense if Pilgrim, or any other LLC, defaults on its decommissioning obligations. NRC's regulation must protect citizen's pocketbooks.

THERE IS NO MEANINGFUL OVERSIGHT PROCESS FOR DECOMMISSIONING

Currently the NRC has little to no meaningful oversight during decommissioning. There are no resident inspectors and no regular inspections. Lack of NRC oversight means licensee compliance with regulations is impossible to verify and enforce on a timely basis. Lack of regular reporting leaves the public in the dark. With no meaningful public involvement, no hearing rights, and no detailed planning required for decommissioning, the lack of NRC oversight means licensee compliance with regulations is impossible to verify and enforce, certainly not on a timely basis. NRC must provide for a meaningful oversight process for decommissioning, including dedicated inspection staff with relevant specialization and expertise, regular inspections and reporting, substantive public information and engagement, and timely enforcement mechanisms.

RESTORE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

The First Circuit Appellate Court justices opined in CAN v. NRC that decommissioning is a major federal action and requires NEPA compliance. "An agency cannot skirt NEPA or other statutory commands by exempting a licensee from compulsory compliance, and then simply labeling its decision 'mere oversight' rather than a major federal action. To do so is manifestly arbitrary and capricious."

The court further opined **"... it is undisputed that decommissioning is an action which, even under the Commission's new policy, requires NEPA compliance 10 C.F.R. 51.95(b)."** The Agency's choice to streamline the process for licensees and deregulate NRC requirements abdicated the agency's responsibility to protect the health and safety of the workers, the public, the environment, and undermined citizen due process.

Decommissioning must be reclassified as a Major Federal Action requiring NEPA compliance and the participation of the EPA in decommissioning. Cleaning up highly contaminated sites requires significant oversight. It should not be driven by licensees or their lack of adequate funding.

NEPA compliance was required and mandated by the court for decommissioning.

When the NRC becomes compliant with the court's mandate, it will:

- Reinstate the use of NRC resident inspectors and increase NRC oversight and public participation. reinstate EPA oversight beyond ground water contamination to address the significant chemical contamination at decommissioning sites.
- It could also support the requirement for an Emergency Planning Zone (EPZ) until the high level nuclear waste is transferred and secured in dry cask storage.

THE NRC SHOULD RESTORE ALL DECOMMISSIONING SAFEGUARDS INCLUDING THE HEARING RIGHTS OF THE PUBLIC

NRC's 1996 revision of the decommissioning regulation eviscerated the hearing rights of the public, as well as states. Public meetings do not constitute the hearing rights required by the Atomic Energy Act and affirmed in *CAN v. NRC*. Adjudicatory hearings offer citizens the right to cross examination and discovery. A public meeting does not afford citizens the level of institutional accountability necessary given the dangers of contamination inherent in the cessation of reactor operations. Informational meetings do not effectively address the concerns of residents since the local community—and, for that matter, states—have no power to effect change in the licensee's choices.

In *CAN v. NRC*, both the Federal District Court and the Appellate Court chastised the agency for this approach. If the community has concerns, and there is no regulatory recourse save one "meeting" with NRC, the Commission will, in fact, create greater polarization between the community and the regulator.

THE DECOMMISSIONING PLAN SHOULD BE REINSTATED TO REPLACE THE PSDAR

Under the 1996 revision to the decommissioning regulations, the NRC eliminated the requirement that licensees submit a decommissioning plan. Instead, licensees are only required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) within two years of final shutdown. **The PSDAR is a brief document, lacking any meaningful detail as to the methodology and site-specific plans. This change has eliminated any meaningful level of transparency and accountability for the conduct of decommissioning, allowing the licensee to proceed in relative secrecy and without NRC oversight.** The decommissioning plan must be a thorough guide and road map for the cleanup process; it is an instrument to hold a licensee accountable for the cleanup commitments it establishes in the plan. A 30-page narrative or report (PSDAR) identifying the licensee's actions does not qualify as a plan and does not establish

verifiable licensee commitments. The rulemaking must reinstitute the requirement that licensees submit a complete, thorough, and substantive decommissioning plan; and that NRC review and approve the plan, and oversee its implementation.

**ADVANCE NOTICE OF PROPOSED RULEMAKING
ONE PUBLIC MEETING IS **ABSURDLY INADEQUATE****

"The NRC will conduct a public meeting to discuss the contents of this ANPR and to answer questions from the public regarding the contents of this ANPR." - NRC

Meetings should be held in every community that hosts a pre-deployed atomic bomb.

Sincerely,

David Agnew
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