

STATE OF VERMONT  
PUBLIC UTILITIES COMMISSION

Joint Petition of NorthStar Decommissioning Holdings, LLC, NorthStar Nuclear Decommissioning Company, LLC, NorthStar Group Services, Inc., LVI Parent Corp., NorthStar Group Holdings, LLC, Entergy Nuclear Vermont Investment Company, LLC, and Entergy Nuclear Operations, Inc., any other necessary affiliated entities to transfer ownership of Entergy Nuclear Vermont Yankee, LLC, and certain ancillary approvals pursuant to 30 V.S.A. Sections 107, 231, and 232.

August 30, 2017

Docket No. 8880

PREFILED REBUTTAL TESTIMONY  
OF RAYMOND SHADIS  
ON BEHALF OF NEW ENGLAND COALITION

Mr. Shadis outlines New England Coalition's positions concerning the proposed ownership transfer and decommissioning plans for Vermont Yankee Nuclear Power Station. He further provides informed perspectives on the ownership transfer, fair-partner qualities, financial assurance, and certain aspects of the joint petitioner's plans for decommissioning, for example, rubbleization, end-state of the site, and site reuse.

Mr. Shadis states why granting the Petition *as it stands* would not on balance serve the public good. Further, he proposes amendments that the joint-petitioners could make to the petition, or failing that, conditions that the Public Utilities Commission could attach to a Certificate of Public Good, that would serve to assure furtherance and protection of the public interest, such that permitting decommissioning to go forward under new ownership would, on balance, serve the public good.

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OF RAYMOND SHADIS  
ON BEHALF OF NEW ENGLAND COALITION

Q1. Please state your name, place of residence, and business address.

A1. My Name is Raymond Shadis. I live in Edgecomb, Maine. My business address is 47

Shadis Road, Edgecomb, Maine 04556

Q2. Please sum your education and experience.

A2. My resume is attached as NEC-RS-PFT-EXHIBIT 1.

In addition:

I was an invited participant/panelist in the Commonwealth Edison -sponsored Keystone Foundation "National Dialogue on Decommissioning" (2001).

I served on the U.S. Nuclear Regulatory Commission's Initial Implementation Evaluation Panel for the (new) Reactor Oversight Process (2000), and an NRC follow-up workshop/panel on "Risk Significance Determination" (2001). I was an invited presenter at NRC Annual

Regulatory Information Conferences (2000, 2001).

Under Maine Yankee Atomic Power Company sponsorship, I participated in development of NRC's NUREG-1738 "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants."

I attended the American Nuclear Society's International Conference on High Level Nuclear Waste (Las Vegas and Yucca Mtn. 2001), a TLG/Entergy Decommissioning Conference (Captive Island, Fla. 2002), ANS Conferences on Decommissioning in Uncasville, Ct. and Traverse City, Mi.

In 2006, I received a Heinrich Boll Foundation invitation and grant to participate in an international conference in Kiev, Ukraine "Chernobyl- Plus 20" on the effects of the Chernobyl nuclear accident.

In 2010 my paper on citizen participation in decommissioning was read on my behalf before an international conference on decommissioning at the Technical (Nuclear Enclave) City of Sosnovy Bor, Russia.

In 2012, the Union of Concerned Scientists sponsored my appearance in Forum on Nuclear Safety, MIT, Cambridge, Ma.

In 2014, I was an invited presenter at a U.S. State Department-funded International Roundtable on Decommissioning, hosted by Russian NGO Greenworld in Washington, DC. Also in 2014, the Legislature of Leningrad Oblast, Russia, gave me an award recognizing my global contributions to nuclear decommissioning.

In 2017, I will have participated in a second international conference on decommissioning at the Rosatom (Russian Atomic Energy Agency) Training Academy in Saint Petersburg, Russia. The decommissioning conference in Russia in 2017 marks the twentieth year

of a cordial working relationship with Michael Meisner, past CEO and Chief Nuclear Officer of Maine Yankee Atomic Power Company and co-presenter in both Washington and Saint Petersburg.

Q3. Please identify your employer?

A3. I am presently self-employed and since 2006 I have been serving as a technical consultant to New England Coalition. From 1997 through 2006, I was employed by New England Coalition as staff technical advisor. My duties include tracking and reading nuclear power plant operational and compliance documents, regulatory issuances, and power industry journals. It was my responsibility to then make any new information accessible to the NEC Board of Trustees and to initiate an advocacy response to any safety, environmental, citizen rights, or regulatory issues that were identified.

Q4. Have you previously testified before the Vermont Public Service Board?

A4. My testimony has been admitted in Dockets 6545, 7195, 7440, 7600, 7801, 7862 and 8300.

Q5. What is the purpose of your testimony?

A5. The purpose of my testimony is to outline New England Coalition's positions concerning the proposed ownership transfer and decommissioning plans for Vermont Yankee Nuclear Power Station.

I further provide informed perspectives on the ownership transfer, fair-partner qualities, financial assurance, and certain aspects of the joint petitioner's plans for decommissioning, for example, rubbleization, end-state of the site, and site reuse.

I explain why granting the Petition *as it stands* would not on balance serve the public good. I propose conditions that the Public Utilities Commission could attach to a Certificate of Public Good, that would serve to assure furtherance and protection of the public interest, such

that permitting decommissioning to go forward under new ownership would, on balance, serve the public good.

Q6. What is New England Coalition's position with respect to the above-captioned petition?

A6. Having heard the joint petitioner's public presentations, having read the opinions of Entergy's usual cadre of letter writers, having reviewed the petitions before both the VPUC and the NRC, and having harrowed through the discovery material, New England Coalition has come to believe that the petitioners have not adequately demonstrated themselves to be acceptable fair partners for decommissioning a Vermont nuclear plant and their plans for decommissioning do not provide adequate assurance that transfer of Vermont Yankee Nuclear Power Station will favor the public good at this time.

Further, New England Coalition is deeply concerned that the Vernon site itself, having apparently been written off as a used industrial site, is not being accorded appropriate respect as a natural treasure begging restoration and a site of great cultural and historical significance begging, once it is restored, preservation. New England Coalition proposes that the best outcome for the Vernon site would be to allow it to lie fallow as a nature preserve and to heal itself over time.

Q7. Where in your opinion should the discussion between the Public Utilities Commission and the parties about this petition begin?

A7. Taking a lesson from one of the more productive aspects of my experience with the Maine Yankee decommissioning, we should begin with discussion of the **end state** of the Vernon site.

In 1999 and 2000, after Friends of the Coast-Opposing Nuclear Pollution, the Maine Public Advocate and the Maine Department of Environmental Protection intervened before the Federal Energy Regulatory Commission (FERC) on rate adjustments and/or the U.S. Nuclear

Regulatory Commission (NRC) on the Maine Yankee license termination plan (LTP), Maine Yankee Atomic Power Company (“Maine Yankee,” also short for Maine Yankee Atomic Power Station) settled with the parties at FERC, but withdrew its LTP pending settlement with intervenors. Maine Yankee then turned up its efforts to identify and bring to the table all effective stakeholders; in the end: Friends of the Coast (which I represented), the EPA regional office (Boston), the Maine Public Advocate, and several state agencies.

The first discussion was an attempt to develop and reconcile the various visions of condition in which the site would be left following all decommissioning activity including site restoration.

Even though such issues as treatment of deeply buried contamination, rubbleization, and radiological site release criteria remained iterative for more than thirty detailed technical meetings with all stakeholders and even much more numerous one-on-one meetings with individual stakeholders comprising almost daily business at the Maine Yankee while decommissioning proceeded apace. Throughout this process, end state remained a touchstone; a key to understanding and productive dialogue.

With respect to the Vermont Yankee decommissioning, any discussion of the decommissioning process, financial assurance, disposal of demolition debris, non-radiological contamination remediation, visual screening, wetland restoration, residual radiation criteria following NRC license termination will be best served if we know upfront exactly what end state the petitioners are proposing and how it compares to what the vision of the Commission and the intervenors (stakeholders) might be. Put another way, we can best judge proposed actions if we know what they are intended to accomplish.

The Maine Yankee decommissioning experience is relevant to this proceeding because it

makes available a detailed narrative of a successful on-time, on budget, community and stakeholder-involved-and-supported decommissioning of large New England nuclear power station of comparable Vermont Yankee age, regulation and technical advancement.

The Maine Yankee decommissioning experience as outlined in NEC/RS/PFT/EXHIBIT-2 EPRI REPORT, provides valuable lessons typical of those examined under the NRC-encouraged licensee regimen of consulting “industry experience.” We were disappointed when NorthStar responded to discovery requests for evidence of having consulted industry experience with evasiveness.

Q8. You previously stated that New England Coalition is deeply concerned that the Vernon site itself, having apparently been written off as a used industrial site, is not being accorded appropriate respect as a natural treasure begging restoration and a site of great cultural and historical significance begging, once it is restored, preservation. How does that “deep concern” translate to an alternative proposition for end state?

A8. In reviewing the many documents filed in this case (and previous Vermont Yankee cases) I was struck by the fact that not a one mentioned the original natural beauty of the site or the potential natural beauty of a restored site.

A site visit in summer revealed to me that the river, which took Vermont Yankee’s heat and waste during operations, now appears populated by boaters and fishing enthusiasts, birdwatchers and, on the New Hampshire shore, hikers and canoe launchings. Granted the stretch of the Connecticut River fronting the Vermont Yankee site is “slack” water, part of the Vernon Dam impoundment, but this is compensated by the magnificent vista of surrounding mountains.

During the site visit, Richard Holschuh, representative of the Elnu Abenaki, pointed out

to me a grand high rock face North of the site, which was, for some thousands of years until the Abenaki were removed from their homes, a guide or beacon imbued with life and spirit and used to orient distant travelers coming up the river.

Since NRC does not require an Environmental Impact Statement (EIS) or even an Environmental Impact Assessment (EIA) to begin decommissioning, I went to the nearest extant EIS for Vermont Yankee (License Renewal), which I take to be the operative environmental licensing document for all activities at Vermont Yankee, including decommissioning.<sup>1</sup> I found only very limited description of the site's historical resonance and still less of its potential as a natural preserve. This is important since the joint petitioners have acknowledged that they are relying primarily on the License Renewal EIS for an environmental considerations baseline.

Here are characteristic and representative selections of site description from the Vermont Yankee License Renewal EIS, NUREG-1437, Supplement 30 2-86 August 2007:

#### 2.2.9.2 Historic and Archaeological Resources at the VYNPS Site

The VYNPS site occupies approximately 125 ac. No formal archaeological survey was conducted at the VYNPS site prior to initial construction (AEC 1972). There is potential for intact archaeological deposits within the undeveloped areas of the VYNPS site. The VYNPS is located on the floodplain of the Connecticut River. As a result, there is the potential for deeply buried archaeological material...

#### 2.2.3.1 Surface Water

The Vermont Water Resources Board classifies the Connecticut River at the station's

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<sup>1</sup> In developing the 1996 Decommissioning Rule, the Commission determined that decommissioning activities could be safely conducted under the current license conditions and restrictions, and that a detailed decommissioning plan requiring NRC review and approval would be redundant to the activities already authorized by the Commission in the facility license. *Id.* at 39,282. Any actions outside the license would require the licensee to request a license amendment and to justify the why the change was safe. *Id.* at 39,283. From an environmental perspective, "the NRC specifically considered and rejected the idea that review of the PSDAR should be defined as a major federal action under NEPA because environmental analysis of activities to be performed under the PSDAR will necessarily have been performed in accordance with prior site-specific or generic analysis." *Entergy*

*Nuclear Vt. Yankee, LLC, & Entergy Nuclear Operations, Inc.* (Vt. Yankee Nuclear Power Station), CLI-16-17, 84 NRC \_\_, \_\_ (Oct. 27, 2016) (slip op. at 35) (citing 1996 Decommissioning Rule, 61 Fed. Reg. at 39,279, 39,283, 39,286).



point of discharge as a Class B water (VDEC 2006a). Class B waters are managed to achieve and maintain a level of quality that supports aquatic biota, wildlife, and aquatic habitat; have aesthetic value; and are suitable for public water supply with filtration and disinfection, for swimming and other water-based recreation, and for crop irrigation and other agricultural uses (VWRB 2006).

#### 2.2.5 Description of Aquatic Resources in the Vicinity of VYNPS

A number of physical and chemical stresses have caused major changes and modifications to the aquatic resources within the Connecticut River. These include dam construction and operation; urban, industrial, and agricultural contaminants; and land-use changes. Water withdrawal from the Connecticut River for municipal, agricultural, and industrial activities is minimal. There are no reported water availability issues concerning the river (Entergy 2006a). The major industrial use of the river is by the 12 hydroelectric dams. Three dams, Vernon (RM 142), Turners Falls (RM 123), and Holyoke (RM 86) are located downstream of VYNPS. *The Connecticut River is also used for recreation, tourism, and conservation (e.g., the Silvio O. Conte National Fish and Wildlife Refuge).* [Emphasis added for fear this small nod to recreation, tourism, and conservation might pass unnoticed]

#### 2.2.8.4 Visual Aesthetics and Noise

The plant is located on a river terrace. The elevation of the site ranges from 220 ft to approximately 280 ft above mean sea level, which helps shield some of the plant structures from the public road on the west boundary where several residences are located. The plant is periodically visible from the Hinsdale, New Hampshire, side of the river, and landscaping serves to partially blend the site with the surrounding countryside (AEC 1972).

#### 2.2.1 Land Use

The land use within the site boundaries is characterized by grasslands and early succession areas (53 percent), developed areas (28 percent), mixed softwood and hardwood forested areas (16 percent), shrubs (2 percent), and wetlands (1 percent) (Entergy 2006a).

In keeping with standard review practices for regulatory compliance documents, I attempted to retrace the steps in the document's development by a review of the pertinent literature. The Vernon site does not exist in a vacuum and it should not be treated as if it does. It lies on the great bend of the Connecticut River and thus is something of a focal point in the federally designated and constantly evolving 400-mile National Blueway.

On January 3, 2014, the U.S. Secretary of the Interior wrote,

Subject: Supporting Watershed Partnerships

Sec. 5 Connecticut River Blueway Designation. In light of its successful designation, on-the-ground accomplishments, and ongoing, broad support, I hereby reaffirm the designation of the Connecticut River and Watershed as a National Blueway. The Connecticut River Watershed exemplifies coordinated stewardship of a river and its watershed with diverse partnerships of interested communities including over 40 partner organizations, protection of over 2 million acres of habitat, environmental and educational efforts aimed at urban and rural populations, and recreational access to the river, its tributaries, and public lands. The Department is committed to promoting best practices, sharing information and resources, and encouraging active and collaborative stewardship of the Connecticut River and Watershed.

U.S. DOI - Order No. 3 33 1

A simple web search shows that the Connecticut River watershed is humming with conservation and restoration activity and the Vernon site should be seen in that context. Recreational users are not waiting for total riverfront restoration however and the river is busy with organized outdoor recreational activity.

For example, Connecticut River Paddlers Trail organization, in cooperation with 40 state agencies and outdoors-oriented non-profits stretching, as does the river, from the Canadian border to the Atlantic, and locally including Dartmouth College, the Vermont Department of Forests, Parks, and Recreation, Vermont Fish and Wildlife, Vermont Land Trust, and Vermont River Conservancy, maintains more than 40 riverside campsites and over a hundred river access points.

These access points locally include: Old Ferry Road Boat Access, Brattleboro; Retreat Meadows on the West River; Broadbrook just north of Vernon, Hinsdale Access just across the river from Vermont Yankee, Gov. Hunt Recreation area in Vernon, and Stebbins Island Campsite just south of the Vernon Dam.<sup>2</sup>

If further incentive (other than goodwill toward the natural environment and the enjoyment of

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<sup>2</sup> Connecticut River Paddlers Trail.Org

it) is needed, we may consider that fostering appreciation of the outdoors is good business.

The Outdoor Industry Association reports,

Outdoor recreation is a huge economic force in the state of Vermont. It generates \$5.5 billion annually in consumer spending, directly contributes a whopping 51,000 jobs and contributes \$505 million in state and local tax revenue, according to the Outdoor Recreation Economy state report released today by Outdoor Industry Association (OIA).

“No matter your political affiliation, where you live or your walk of life, the outdoors brings us together,” said Amy Roberts, OIA executive director. “From Maine to California, consumers are spending more on outdoor recreation as millions of Americans depend on it for their livelihoods. Outdoor recreation is a powerful economic engine that contributes to businesses and healthy communities in each and every state and is a vital and sustainable sector that relies on investing in and protecting America’s public lands and waters.”

OIA’s report also highlights that 72 percent of Vermont’s 625,000 residents participate in outdoor recreation each year...

The Vermont Outdoor Recreation Economic Collaborative (VOREC) effort is formalizing and activating an economic sector that’s been overlooked for too long. We’ve built a team of companies and organizations that will advise our governor on the best ways to increase outdoor participation, increase outdoor business opportunities, and strengthen the environmental quality of our recreational assets,” said Michael Snyder, Commissioner of Vermont Forests, Parks & Recreation. Throughout the process, the positive responses from throughout the public and private sector have been almost overwhelming. Our collaborative was officially formed in June, will gather for a two day policy retreat in early August, will canvas the state for public comment into September, and will then provide our first recommendations to the Governor shortly after that. Throughout this process, OIA’s data has been a key reinforcement of the things we all already knew — that outdoor recreation is a fundamental driver of the Vermont economy.

*For Immediate Release, Sunshine Sachs, Emily Walsh, Boulder, Colo. — Jul 26, 2017 OutdoorPress@sunshinesachs.com*

Thus, allowing the Vermont Yankee site to lie fallow and over time heal itself of radiological pollution through the natural decay of radionuclides, the local economy may actually benefit more than it would through further industrial activity. It falls to the State of Vermont, the Town of Vernon, and local stakeholders to choose whether they will ride with the 21<sup>st</sup> century flood of river shoreline restoration or exit with the 19<sup>th</sup> century ebb of industrialization.

It is important to remember that mostly because of ISFSI security considerations no decommissioned commercial nuclear power plant site has thus far been repurposed for industrial or commercial use while both the Maine Yankee and Connecticut Yankee sites boast nature preserves and open land.

Connecticut Yankee teamed with Conservation Law Foundation to lay out and set aside its preserve.

Maine Yankee agreed with Friends of the Coast to set aside 200 of its 700 acres for a nature preserve and center for environmental policy dialogue. The agreement guaranteed public access for recreational use and natural resource harvesting e.g., fishing, shellfish gathering, hunting, etc.

These licensee-stakeholder partnerships should serve as a model for Vermont Yankee.

Q9. That said, do you foresee any practical limitations on site reuse for, as suggested by NorthStar, a solar power station?

A9. Unless Entergy VY radically changes its security plan, it is unlikely that a field of solar collectors can be installed until after the Department of Energy removes the 1000 tons of irradiated fuel currently on site. In Docket 8300 Entergy testified that NRC, as a matter of security, forbids any further line-of-sight obstruction around the ISFSI<sup>3</sup>, which hangs somewhat inconveniently just below the site's midriff.

Maine Yankee entertained a number of proposals for reuse of the industrialized portion of its site but they were rejected because of security considerations. At one point,

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<sup>3</sup> Independent Spent Fuel Storage Installation

a well-known yacht-builder offered to buy Maine Yankee's centrally placed and purportedly radiologically unaffected office building but security personnel did not want an "under cover" potential staging area for terrorist assault in proximity (about 200 yards) of the ISFSI.

There may be a question of liability as well. It bears further investigation.

At Maine Yankee, local governments were considering a remote portion of the site for a new regional jail, but attorneys warned that incarceration on a former nuclear site could trigger an avalanche of lawsuits.

Whatever the Board and the parties conceive of as site reuse will unavoidably color our view of proposed decommissioning activities.

Q10. How can the Commission best affect how the site is reused?

A10. The Commission should make the (fallow) rest and healing period a required part of site restoration. The opportunity presents itself because not all parties believe that restoration requirements are a settled matter. Entergy executive T. Michael Twomey told a Vermont NDCAP meeting on December 1, 2016,

As part of the public service board proceeding, you've got to have the public service board adopt appropriate site restoration standards which means after you've the radiological decontamination of the site you still have to make sure...[of] whatever the state requirements are for whatever condition that the site needs to be in. We refer to that in shorthand as site restoration standards.

There were some very general standards discussed back in 2002 when Entergy bought the plant from Vermont utilities, but they're not specific enough to allow us to know how to complete this transaction...NorthStar will propose certain standards that...will be subject to review and comment and deliberation by the public service board.

*Transcribed from a December 1, 2016 NDCAP recording by New England Coalition*

Q11. How long would you recommend the site lie fallow?

A11. There is generally agreement in the scientific community that any small quantity of radioactive material will have lost its punch over about ten half-lives<sup>4</sup>.

Some reactor-derived radionuclides have very long lives and will remain part of the site for ice ages to come. Carbon-14, for example, has a half-life of 5,730±40 years. So it will decay away in about 57 thousand years. Plutonium -239 has a half-life of 24,100 years, so it will take a quarter of a million years or so to decay away. Fortunately, of all of the radionuclides that a reactor produces, Carbon-14 and Plutonium -239 are among the least abundant and least energetic and most easily shielded by water or earth. Unless ingested, their dose contribution is considered minor.

At Maine Yankee, we found the most significant dose contributors to be Cesium 137-half-life 30.17 years, Cobalt -60 half-life 5.26 years, and Strontium-90 half-life 28.8 years. I would expect the array of significant dose contributors at Vermont Yankee to be similar, except considering the history of Tritium spills during Entergy's tenure, I would add Tritium (radioactive hydrogen, usually presented as a compound, i.e. water) half-life 12.3 years.

Thus, the average half-life of residual radionuclides at Vermont Yankee would be about 19 years. So, unless the contamination is severe, leaving the ground undisturbed for about 190 years would address these concerns. Therefore, the Commission should order that after site restoration has been completed, the site should be maintained as a nature preserve, with no industrial, commercial or residential use for that period of time or until the Commission orders otherwise.

Q12. Isn't the Public Service Commission barred from considering radiological issues by federal

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<sup>4</sup> Another feature of each radionuclide is its half-life. Half-life is the length of time it takes for half of the radioactive atoms of a specific radionuclide to decay. A good rule of thumb is that, after **seven** half-lives, you will have less than one percent of the original amount of radiation.

preemption?

A12. My understanding is that during the term of the NRC license, NRC rules the field and there is no role for the state in regulating the handling and disposition of licensed radioactive materials.<sup>5</sup> That is the important distinction in discussing the end state.

Massachusetts framed a law requiring that upon industrial site vacancy residual radiation levels must not exceed 10 mR all pathways and 4 mR from water. Although the original law excluded commercial power reactors, Massachusetts officials invoked its standards pressing Yankee Rowe to decommission to 10 and 4. The owners of Yankee Rowe acceded and did not pursue preemption claims.

In 1999 Maine Yankee came to agreement with Friends of the Coast that it would decommission to the 10 mR all pathways/ 4mR water standard, but for a time, dreading another layer of oversight on radiological survey and remediation work, fought casting that standard into Maine law.

Friends of the Coast prevailed and Maine law Chapter 14-A §1455 was passed.

§1455. Nuclear facility decommissioning cleanup

2. Radiation dose standard. The site at which the **decommissioning** of a nuclear power plant **has been completed** must meet the following standards, as determined by the department: [Emphasis added]

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<sup>5</sup> *Pac. Gas. & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n*, 461 U.S. 190, 207 (1983) (citations omitted). See also *Entergy Nuclear Vt. Yankee, LLC v. Shumlin*, 733 F.3d 393, 409 (2d Cir. 2013) (radiological safety "represents an arena of field preemption that Congress, acting within its proper authority, has determined must be regulated by its exclusive governance, thus precluding any regulation by the states."); *Skull Valley Band of Goshute Indians v. Nielson*, 376 F.3d 1223, 1250 (10th Cir. 2004) ("Under the federal licensing scheme...it is not the states but rather the NRC that is vested with the authority to decide under what conditions to license an SNF storage facility."); *Bullcreek v. NRC*, 359 F.3d 536, 538 (D.C. Cir. 2004) ("[T]he AEA confers on the NRC authority to license and regulate the storage and disposal of [SNF]."); *Pet. of Entergy VY for a CPG to construct a dry fuel storage facility at the VY Station*, Docket 7082, Order of 4/26/06 at 15 (recognizing federal preemption of state-level regulation of spent nuclear The scope of federal preemption applies equally to decommissioning facilities and operational facilities. See *Missouri v. Westinghouse Elec., LLC*, 487 F. Supp. 2d 1076, 1086 (E.D. Mo. 2007).

- A. The residual radioactivity distinguishable from background radiation results in a total effective dose equivalent to an average member of the critical group of not more than 10 millirems, or 0.10 millisievert, per year, including that from groundwater sources of drinking water; and [1999, c. 739, §3 (NEW).]
- B. The residual radioactivity distinguishable from background radiation in groundwater sources of drinking water results in a total effective dose equivalent of not more than 4 millirems, or 0.04 millisievert, per year to the average member of the critical group. [1999]

Similar to the Massachusetts law, the Maine law kicks in after the NRC has taken back the license.

New Jersey officials take a hard stand on site release criteria as evidenced by the following e-mail from Administrator Jenny Goodman,

**From:** Goodman, Jenny [<mailto:Jenny.Goodman@dep.nj.gov>]

**Sent:** Monday, July 10, 2017 11:16 AM

**To:** Mary Lampert <[mary.lampert@comcast.net](mailto:mary.lampert@comcast.net)>

**Subject:** RE: NJ RADIATION SITE CLEANUP STANDARDS FOR  
COMMERCIAL NUCLEAR REACTORS

The Nuclear Regulatory Commission has exclusive authority for the regulation of commercial nuclear power plants.

That being said, if the owner ever wants to sell the property of the former facility, they would have to meet NJDEP standards.

So typically, most NRC licensees (like military bases, for example) just use our standards.  
[Emphasis added]

Our Subchapter 12 has values for remediation standards for the naturally occurring radionuclides, but not fission products.

The utility would need to develop their own that comply with N.J.A.C. 7:28-12.8.

That is, they would have to comply with 15 mrem/y annual dose instead of the NRC's annual allowable dose of 25 mrem/y.

They would also have to comply with our groundwater standards, which are EPA's safe drinking water standards.

Let me know if I can be of any further assistance.

Jenny

Jenny Goodman, Manager

NJ Department of Environmental

Protection Bureau of Environmental

Radiation

Mail Code 25-01

PO Box 420

Trenton, NJ 08625-0420



Phone (609) 984-5498  
Fax (609) 984-5595  
24 Hour Emergency 1- 877- WARN DEP  
<http://www.state.nj.us/dep/rpp/ber/index.ht>  
<http://www.nj.gov/dep/aqes/index.html>

Q13 Why is there such concern over whether residual radiation levels are at 10 or 15 or 25 millirem/year when background radiation levels that we all live with are said to be 300 or 360 millirem/year?

A13 The 10, 15, and 25 millirem levels are designated in regulation and in License Termination plans “as distinguishable from background.” They are not submerged in the background numbers but on top of them and the differences between them when expressed as risk are not insignificant.

In 1996, Carol Browner, Administrator of EPA wrote a letter to NRC Chairman, Shirley Jackson, complaining in plain language that NRC’s maximum allowable radiological site release level of 25 mR all pathways with no separate and distinct limit for water was “not protective [of human life] under CERCLA<sup>6</sup>” while EPA’s limits of 15 mR all pathways and 4 mR from water was “protective” NRC ADAMS accession numbers -ML992920056 and, ML0327/ML032790584.pdf

While varying exposure limits may have small differences in actual risk, they are by no means trivial.

The National Academies Committee to Assess Health Risks from Exposure to Low Levels of Radiation most recent report (BEIR<sup>7</sup> VII, 2005) is the most reliable source to

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<sup>6</sup> Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) or Superfund is a United States federal law designed to clean up sites contaminated with hazardous substances and pollutants.

<sup>7</sup> BEIR – Biological Effects of Ionizing Radiation

understand health risks from low levels of radiation. The committee was set up to advise the US government on the relationship between exposure to ionizing radiation and human health. The members of the committee responsible for the report were chosen for their special competences and with regard for appropriate balance. The latest study (2005) was supported by the Environmental Protection Agency, the Nuclear Regulatory Commission, and the U.S. Department of Commerce, National Institute of Standards and Technology Grants.

As the BEIR table below shows, the risk of cancer is linearly related to the absorbed dose. For example, if an annual absorbed dose of 10 millirems will likely be fatal to 5.7 out of ten thousand people, an annual absorbed dose of 25 millirems will be fatal to two and one-half times as many, about 14 per ten thousand.

BEIR VII Risk Estimates

<b>Lifetime Exposure (millirem/per year)</b>	<b>Lifetime Risk of Fatal Cancer<sup>7</sup></b>	<b>Note</b>
0.03	About 1.5 in 1,000,000	
1	About 5.7 in 100,000	
5	About 2.9 in 10,000	
10	About 5.7 in 10,000 (about 1 in 1750)	Current Massachusetts Limit for Unrestricted Use for its licensees, Maine Yankee LTP Limit, Rowe LTP Limit, CY LTP Limit
15*	About 8.5 in 10,000 (about 1 in 1166)	Current New Jersey Limit for Unrestricted Use, NorthStar Proposed Limit
25	About 14 in 10,000 (about 1 in 710)	NRC Limit for Unrestricted Use

Total Cancer Incidence resulting from whole body exposure is 1.5-2.0 times the mortality risk.

\* Risk extrapolation for 15 mR by Raymond Shadis, New England Coalition, 2017

Additional factors that tend to compound the public's misconceptions about the importance of strict residual radiation site release or end state criteria are found in the little

recognized fact that federal law actually favors radiation over non-radioactive pollutants, e.g., mercury, arsenic, PCBs, etc., by allowing higher risk limits for radiation. This throwback to the Manhattan Project, the beginning of the Cold War and the Atoms for Peace Program, has no basis in science or in preventative health disciplines.

The Commission should recognize that the NRC and EPA, treat radiation as a “privileged” contaminant and allow far more risk of radiation-caused cancer than for cancer caused by chemical contaminants. The EPA-allowed cancer incidence risk for a mixture of chemicals is one in a hundred thousand, and the allowed cancer incidence risk for one chemical is one (1) in a million.

So, first, the risk of radiation-caused cancer that the NRC and EPA allow would not be considered remotely acceptable in any other context.

Second, individual states are free to set, and this Commission is free to recommend, radiation risk limits that are more conservative than the NRC’s 25 millirem per year.

For example, in the early 1990s, even before BEIR VII, the Massachusetts Department of Public Health (DPH) set a 10 millirem per year radiation limit for decommissioned unrestricted sites that are state-licensed; and, in 2006, Yankee Atomic signed an agreement with DPH to follow the department’s 10 millirem radioactivity standard; and, to meet the EPA’s Maximum Contaminant Levels (4 millirem per year) for drinking water.

Although ignored by NRC and EPA radiation standards, the actual risk depends on age and sex.

The National Academy reported that overall cancer mortality risks for females are 37.5 percent higher than for men, and the risks for all solid tumors (lung, breast, and prostate) are almost 50 percent higher.

The differential risk for children is even greater. The same radiation in the first year of life

for children produces three to four times the cancer risk as exposure between the ages of 20 and 50. Female infants have almost double the risk as male infants. But radiation standards do not take these into account and are based instead on the risk of a hypothetical healthy 30-year old man.

The risk to a person also depends on how long he or she was exposed. Risk is typically determined based on a lifetime (e.g., a 70 year) exposure to the healthy 30- year old man. A shorter period of exposure, e.g., a person lives in the same location and receives the same annual dose for only 26 years, does not change the risk as much as might be expected. The calculated risk for a shorter exposure period usually assumes that most of those years are as an infant and child, and the risk to them is considerably higher than to an adult.

Radiation works synergistically with other contaminants. Vermont Yankee's site has both radiological and chemical contaminants. Yet, standards and proposed institutional and engineering controls typically do not, but should, evaluate the cumulative risk posed by radiological and chemical contaminants that remain at the site after decommissioning.

Finally, in addition to radiological concentrations, the volume of radiological contaminants really matters when it comes to determining how many individuals, all biota and not just human beings, will be exposed. This is really important when it comes to internal dose or number of doses from respirable or ingested particles.

Internal doses allow radionuclides which do not emit strong penetrating rays, and thus often elude detection, to cause great damage by emitting alpha or beta particles when in contact with unprotected and sensitive tissue; in lungs, bone marrow, and in reproductive and other internal organs.

Thus, mixing or blending contaminated soil or concrete with less contaminated soil to achieve clearance levels for concentrations may not reduce the biological impact of the

contamination but actually aggravate it. By spreading contamination and increasing the surface area of contaminated material, blending and mixing may actually facilitate radionuclide uptake and transport. This phenomenon should be kept in mind when we discuss the practices of rubblization, grading, and fill.

*In light of the foregoing considerations I most strongly recommend that the Public Utilities Commission and the State of Vermont follow the example of Maine, Massachusetts, and Connecticut Yankee and adopt the **New England Standard** for site residual radiation of 10 mR all pathways and 4 mR for water.*

Q14 Have you concerns about the viability of NorthStar's proposed decommissioning plans?

A14. I do and my concerns are informed by my experience with the Maine Yankee decommissioning as well as a review of the pertinent literature. As I stated in my affidavit on behalf of New England Coalition opposing Northstar's Motion for a Second Protective Order, May 16, 2017,

In preparation for drafting my testimony, I have reviewed the joint petitioner's application and prefiled testimony, as well as the petitioner's responses to information requests from the parties. My review has thus far yielded heightened my concerns regarding confidence levels for NorthStar's ability to carry out NorthStar's decommissioning plans as proposed.

As I understand it, NorthStar proposes to proceed with a multitude of individual contractors engaged under 800-900 fixed-price contracts for very specific tasks, strictly limited in scope and schedule (time allotted). Some contracts may be limited according to NorthStar to as little as 80 man-hours. This multiplication of owner-contractor interfaces, with some 900 moving parts, raises risk-levels for (a) miscommunication, (b)duplication of effort, (C) loss of quality assurance and quality control, (d) loss of continuity in the hand-off from one contractor to

another, (e) maintenance of overall stewardship sensibilities and project momentum, (f) essential esprit d' corps; all cumulative negative impacts on budget and schedule such that a \$125 million loans instrument as proposed won't cover it.

NorthStar assigns a 10 percent cost buffer or margin to each contract and requires contractors to provide individual performance bonds for their individual work packages. NorthStar says this will cover any errors or individual failings. But NorthStar does not account for the pile-up-on-the-freeway effect on decommissioning contractor traffic that a single contract default of quality or schedule can have.

NorthStar is not prepared for a massive increased-cost surprise (\$400 million give or take) such as occurred during the Connecticut Yankee decommissioning. In that instance, the Decommissioning Operations Contractor (DOC), Bechtel relied on faulty licensee surveys to determine location and quantities of radiological contamination requiring remediation. When, well into decommissioning, massive contamination was found, Bechtel wanted to change the terms of its contract, adding more than \$200 million to its compensation. The other part of the surprise cost is attributed to added NRC regulations and requirements. NorthStar tells us that such increased regulatory costs are unlikely for a defueled, decommissioning reactor, but Thomas LaGuardia (TLG) warns that the potential for increased costs due to emerging regulation is a very good reason to switch from SafStor to Prompt decommissioning. To hope it won't happen is simply not prudent management.

Likewise, failing to take a lesson from the Connecticut Yankee experience, NorthStar is proceeding relying on Entergy's 2014 Site Assessment and the representations of Entergy personnel, employees of a company almost breathlessly eager to shed all of the liabilities of decommissioning, which in VPSB Docket 6545 Entergy said it would assume. On June 11,

2017, William Irwin, Sc.D, CHP, Radiological and Toxicological Sciences Program Chief,  
Vermont Department of Health wrote in an affidavit filed with NRC,

The investigation and characterization of the Vermont Yankee site (radiological and non-radiological) has not yet occurred. Rather, Entergy has elected to wait decades until nearly the end of the allowed SAFSTOR period before engaging in this investigation and characterization. Further, NorthStar does not intend to do a full site investigation and characterization before purchasing Vermont Yankee. The decision to delay site investigation and characterization calls into question all of the cost estimates that Entergy and NorthStar are relying on in the PSDAR, Revised PSDAR, and related filings. Without a full site investigation and characterization, there is no way to determine what it will ultimately cost to perform radiological decommissioning, spent fuel management, and site restoration. [Emphasis added]

Dr. Irwin prefaced this statement with,

There is significant risk that, if approved, the sale of Vermont Yankee to NorthStar will lead to a shortfall in the amount of funding available to fully and safely decommission and radiologically decontaminate Vermont Yankee and manage its spent nuclear fuel. This would place public health, safety, and the environment at risk.

Based on my experience at Maine Yankee where deep pockets of radioactive contamination of surprising intensity were found well after decommissioning had begun, I concur with Dr. Irwin's statements. I have attached his complete affidavit as NEC-RS-PFT EXHIBIT 4. One great difference between Maine Yankee and Entergy Vermont Yankee is that the former was a rate base plant and could always seek to recover unexpected costs through rate requests. NorthStar hopes to own a defunct merchant plant with no source for funds on the order of that required for Connecticut Yankee. Proceeding blind and without sufficient backup is, I believe, reckless and unprofessional. It may even be that shortcomings and complications engendered by NorthStar's approach will throw Vermont Yankee back into SafStor with a much diminished decommissioning fund such that it would jeopardize even a 60 or 70 year completion. This is not an unsupported concern, as NRC requires that sufficient balance be kept

in decommissioning funds such that should prompt decommissioning fail, the facility may be returned to SafStor.

NRC Staff has expressed concern for financial assurance from LLC licensees [and applicants] like NorthStar.

Current and potential organizational structures of many power reactor licensees and their corporate affiliates are complex and evolving. The staff believes that the public health and safety implications of such structures warrant further examination. A licensee subsidiary without assets other than the licensed reactor could renege on its decommissioning obligations if forced to shut down prematurely. Given that corporate law generally limits the liability of stockholders, the NRC may not have recourse to the assets of a parent company if its subsidiary defaults absent legally enforceable commitments by owners. Case law with respect to bankruptcy proceedings is also ambiguous. Although bankruptcy courts have generally directed bankruptcy trustees to make justifiable, legally required expenditures to protect public health and safety, it is not clear that these expenditures will always have a high priority relative to other claims. The staff believes that it should evaluate possible ways to increase assurance of decommissioning funds availability. An increased degree of confidence may be appropriate to assure that the problems that the Office of Nuclear Material Safety and Safeguards has had with some of its licensees abandoning materials sites prior to cleanup will not be experienced for power reactor licensees.

*Issuance of An Advance Notice of Proposed Rulemaking on the Potential Impact on Safety of Power Reactor Licensee Ownership Arrangements, SECY-93-075, March 24, 1993, at page 1.*

The preceding quote is contained in the *Synapse* Report, FINANCIAL INSECURITY: The Increasing Use of Limited Liability Companies and Multi- Tiered Holding Companies to Own Nuclear Power Plants, David Schlissel, Paul Peterson and Bruce Biewald, Synapse Energy Economics, Cambridge, MA , August 7, 2002, which I have attached as NEC RS PFT EXHIBIT 4.

My recommendation is that in order to assure the decommissioning of Vermont Yankee is financial secure the Commission should require NorthStar to post of a performance bond of at least \$200 million. If NorthStar doesn't have collateral sufficient to support that, then it likely doesn't have assets sufficient to support raising money to meet



any large surprise costs either.

Q.15 What are your concerns regarding the proposed “rubblization” and burial in situ of concrete demolition debris at Vermont Yankee?

A.15 My concerns are fourfold.

First, the Vermont Yankee site is a Native American cultural site with profound religious and ancestral implications. Establishing a demolition debris landfill on earth enriched with the blood and bones of several thousand years of Abenaki residence strikes me as extremely disrespectful. To proceed with tipping industrial waste concrete into the Vermont Yankee foundations while knowing what the site once was is in my opinion tantamount to a hate crime.

Secondly, the alkaline chemical reaction of concrete with (acid) rainwater, groundwater, wet soil is greatly enhanced by rubblization. Concrete conduits, walls and slabs are typically reduced to dust, grit, and pieces of rubble no greater than 10 inches in diameter. This increases the interactive (soluble) surface of the original material by several orders of magnitude also by increasing absorption, increasing solubility. The Maine Department of Environmental Protection found that just the enormous volume of concrete rendered it a hazardous material subject to hazardous material disposal regulations. NorthStar has performed no analysis of the impact of leachate from the giant concrete percolators it proposes to fashion on the chemistry and biota of surrounding soil and the receiving waters of the Connecticut.

Thirdly, there will inevitably be negative radiological implications. While NorthStar proposes to crush and deposit only radiologically “clean” concrete, clean is a misnomer. Most concrete is slightly radioactive, averaging dose rates of about 3 mR per year, largely

due to naturally occurring radiation from Thorium, Uranium, and Radium daughters including Radon in the aggregates. What NorthStar should be saying to the public and to stakeholders is that they intend to rubblize concrete on which surface scans find radiation intensities indicating that the content is below radiological clearance levels and in fact most radioactive contaminants are found within the top ¼ to ½ inch of the surface. However, even at 3 mR, radioactive aggregate can complicate and frustrate radiological survey work and serve to mask reactor derived radionuclides.

In practice a single pass of scabbling tools, toothed-abrading drums or wheels, usually set at a depth of 1/8 of an inch, removes most if not all detectable radiological contamination. But not always, contamination can follow minute fissures, porous areas, and penetrations deep into the concrete. A very thin layer of concrete, less than a quarter of an inch, will completely mask from detection alpha emitters, such as Plutonium-239 and beta emitters such as Strontium-90. All too often they are found only by measuring gamma-emitting surrogates and assigning quantities according to what ratio of one to the other one might expect to find.

The difficulty in ferreting out such hotspots increases exponentially if a concrete wall is knocked down and broken up before every last exacting step of radiological survey and analysis is completed. This may be why, based on Maine Yankee's example, I believe NorthStar will after careful accounting find that it is cheaper to simply assume that any concrete that could possibly be contaminated is contaminated and to see it shipped to licensed, engineered, monitored storage.

Maine Yankee had at first proposed rubblization and a 25 mR site release limit, but meeting with strong opposition from state agencies and other stakeholders, Maine Yankee

decided to leave rubbleization aside and also to adopt the 10/4 site release criteria. Uldis Vanags, testified to Maine Yankee's change of position in Docket 7440. Vanags was Vermont State Nuclear Engineer at the time of his testimony. He had been Maine's Nuclear Safety Advisor at the time of the Maine Yankee decommissioning and so could attest to the very strong stands regarding rubbleization taken by Maine state agencies. Please see NEC RS PFT EXHIBIT 5, the testimony of Uldis Vanags, (attached) for details. Rubblization must be avoided because it can too easily lead to either intentional or inadvertent blending or mixing of contaminated concrete with the deceptive lure of achieving clearance levels for the whole. As I stated earlier rubbleization makes contaminants, including radionuclides, more susceptible to air and water migration.

Fourth, the Joint Petitioners hold no permit for the establishment of an industrial landfill, nor do they have a permit for the onsite disposal of hazardous waste. While there is quibbling over whether the prohibition against rubbleization in the Docket 7862 is binding or precisely a prohibition, there can be no quibbling over the expressed intent of Jay Thayer, Site Vice-President of Entergy, Vermont, Yankee, who while under oath in cross-examination during Docket 7440, made the clear commitment on behalf of his company to no rubbleization as recorded in the following transcript excerpt:

Cross Examination of Jay Thayer

VY 7440 May20 - Vol. I, (Pages 71:12 to 72:25)

71

12 BY MR. COTTER:

13 Q. And presumably the decommissioning cost  
14 estimates that TLG have prepared to date take into account  
15 the one line that led to contamination historically?

16 A. Yes.

17 Q. I want to just touch base, and then I'll turn

18 it over to Mr. Burke, about the concept of rubblization.  
19 In your rebuttal you agreed with Mr. Vanags that  
20 rubblization would not be used as part of the  
21 decommissioning process at the site; is that correct?

22 A. I did. Yes.

23 Q. And yesterday, and I think you were here, Mr.  
24 Cloutier was on the stand, and he actually discussed the  
25 fact that there are two types of rubblization. One was

72

1 where clean concrete was used as fill, and the other was  
2 where you could take some contaminated concrete and blend  
3 it with some other clean material presumably to get the  
4 level of contamination down, and use that combination as a  
5 fill. Were you here for that item?

6 A. I was.

7 Q. When you agreed with Mr. Vanags that  
8 rubblization would not be used, which of those two or  
9 both, were you agreeing to not use?

10 A. I was agreeing to not use the -- or I was in  
11 my mind, it was the rubblization of clean concrete. I've  
12 done decommissioning work. I spent about 10 years in the  
13 decommissioning business. And I've never believed that it  
14 was a practical alternative to blend contaminated material  
15 with clean material to produce an acceptable result. That  
16 is, from a practitioner standpoint, that's not an  
17 acceptable practice.

18 So I was focused on the use of clean concrete  
19 as rubblized into small pieces, using that as back fill,  
20 and that has become a practice which is not used in  
21 nuclear decommissioning.

22 Q. Okay. So just to be clear, you were agreeing  
23 to no rubblization of any kind?

24 A. I guess you could say that, yes.

25 Q. Okay. Thank you.

Q16. If somehow this commitment could be set aside, do you still have concerns about Entergy and NorthStar's attempt to utilize rubblization without justifying departure from prior Board orders?

A16. Yes, I do. New England Coalition's lawyer has already briefed this issue. The Department's response was that this issue could be decided at trial on the merits. Therefore, I

am addressing it now.

My concern and that of the New England Coalition is based on public policy. The Coalition and other intervenors argued for and obtained the condition that rubbleization would not be used. Docket No. 7862 was not appealed in part on reliance on that condition. If NorthStar is correct that Board Rule 2.221 and Vermont Rule of Civil Procedure 60(b) do not apply, it seems to us that there still must be some showing that a prior Commission or Board order needs to be changed that goes beyond just saying it was wrong when it was issued or it really wasn't final and binding even though it was a condition of Board approval.

If NorthStar is correct, then the terms and conditions of Certificates of Public Good don't establish the rules that all parties can reliably expect to govern the future of the permitted facility. The terms and conditions of a CPG are just the starting point of a discussion. That strikes us as disrespectful of the Commission and grossly unfair to intervenors. Intervenors don't have the resources to engage in that discussion throughout the life of a project. We fear that hard-won permit conditions will later be watered down or discarded.

The standard that makes sense to us if Vermont Rule of Civil Procedure is not applicable is the standard that applies under zoning and Act 250. As our attorney has explained in our brief, the Vermont Supreme Court has held any request to amend those permits or conditions must demonstrate: (a) changes in factual or regulatory circumstances beyond the control of a permittee; (b) changes in the construction or operation of the permittee's project, not reasonably foreseeable at the time the permit was issued; or (c) changes in technology. Second, if such a change has been demonstrated, there are certain situations where an amendment may not be justified, for instance where the change was reasonably foreseeable at the time of permit application. Otherwise, the initial permitting process would be merely a prologue to continued

applications for permit amendments.

NorthStar and Entergy have not submitted any evidence that would justify elimination of the prohibition against rubbleization under these standards.

Q17. Do you have other concerns about rubbleization that Entergy VY and NorthStar have not addressed?

A17. Yes. My concern is that burying demolition debris on the site is regulated by the State of Vermont under the statutes and rule governing solid waste disposal. These are Chapter 159 of Title 10 of the Vermont Statutes, and the Vermont Solid Waste Management Rule. Demolition waste is a form of solid waste. Disposing of it on site requires the prior approval of the Agency of Natural Resources, which must certify the facility and approve of the siting of the facility before any rubbleization occurs.

NorthStar's failure to consider the timing and likelihood of obtaining ANR approvals is another reason that NorthStar's cost estimates are unreliable. NorthStar's failure to consider the need for ANR approval also means that the proposal presently before the Commission – which does not include obtaining ANR approvals under Chapter 159 – is unlawful. Any CPG from the PUC should be conditioned upon compliance with Chapter 159.

Q18. Why did you say earlier that you had concerns that NorthStar might prove not to be a fair partner for Vermont?

A18. My understanding of fair partner qualities is based on what the Public Service Board has said about it in the past:

“assessments of technical and managerial competence, of financial strength and soundness, and of matters related to reputation and conduct (often stated as whether the owner, manager or operator will be a fair partner for Vermont).”

Docket 7862, *Am. Pet. of Entergy VY for amendment of CPG*, Order of 6/19/13 at 7 (citing Docket 7770, *Am. Joint Pet. of Central Vt. Pub. Serv. Corp.*, Order of 6/15/12 at 23).

NorthStar seems to have a penchant for casual language that is unnerving in the context of one of the largest, most seriously intentioned projects on Vermont's horizon. Early pronouncements by the joint petitioners of the NorthStar purchase bid used terms like "dream team" to describe companies that NorthStar admitted in discovery had no partnership privileges or duties, did not meet, vote, or even send Christmas cards. NorthStar continues to try to take on some gloss from the experience and technical skill of its chosen contractors; even did so in its NRC license transfer application. To our best knowledge it has signed a contract with only one of its dream team, AREVA and at that persists in calling this straight forward industrial contract, a joint venture. NorthStar appeared before the Vernon Select Board and set hearts racing by suggesting that the Vermont Yankee site might be a perfect fit for a solar generating station even hinting that NorthStar might support such an initiative. In discovery NorthStar said it was just an idea which it had no interest in pursuing further. NorthStar told this Commission that it would not keep Entergy's commitment not to rubble because it was not part of NorthStar's business plan; while more or less at the same time telling the NRC that NorthStar's decommissioning cost estimates were conservative because they did not include rubble, a possibility NorthStar had only recently fastened on. NorthStar told the NDCAP group that it would seek out stakeholders and engage in meaningful consultation on decommissioning issues with them. So far, NorthStar has hosted a large community informational presentation, which featured free beer, but no stakeholder consultation that we know of.

A flood of letters supporting the sale to NorthStar, mostly from Entergy's usual cadre of letter writers, has appeared in Vermont and New Hampshire publications. Meanwhile Joe Lynch,

Entergy Vermont Yankee Governmental Affairs Officer told Nuclear Energy Insider, June 28, 2017.

The Vermont Yankee project has shown that operators can leverage local support for the plant during the operations phase to encourage the community to contribute towards efficient decommissioning operations

Discovery responses to New England Coalition have so far been by alternating turns, oblique, irrelevant to the question, deliberately obtuse, and altogether unresponsive.

Getting good discovery from the joint petitioners has been for New England Coalition much like trying to return a defective used car to a “Buy Here-Pay Here” lot.

I did not intend this recitation as an indictment, but only as advice as to what has been troubling us about doing business with NorthStar.

Q19. Please summarize your recommendations to the Commission.

A19. My recommendations are:

1. The Commission should follow the examples of Maine, Massachusetts, and Connecticut Yankee and adopt standards for site residual radiation of 10 mR all pathways and 4 mR for water. Agreement to these standards should be a condition of approval.
2. The Commission should order that after site restoration has been completed, the site should be maintained as a nature preserve, with no industrial, commercial or residential use. Agreement to this post-restoration use should be a condition of approval.
3. The Commission should condition approval upon posting of a performance bond of at least \$200 million to guarantee complete radiological and non-radiological decommissioning.



4. The Commission should refuse to modify the prohibition against rubbleization and should also affirmatively rule that rubbleization is prohibited.
5. The Commission should condition approval upon compliance with Chapter 159 of Title 10 of the Vermont Statutes Annotated, governing solid waste disposal.

Q20. Does that complete your testimony?

A20. Yes, at this time.