

**STATE OF VERMONT
PUBLIC UTILITY COMMISSION**

Docket No. 8880

**Joint Petition of NorthStar Decommissioning Holdings, LLC)
NorthStar Nuclear Decommissioning Company, LLC, NorthStar)
Group Serviced, Inc., LVI Parent Corporation, NorthStar Group)
Holdings, LLC, Entergy Nuclear Vermont Investment Company)
LLC and Entergy Nuclear Operation, Inc., and any other)
necessary affiliated entities to transfer ownership of Entergy)
Nuclear Vermont Yankee, LLC, and for certain ancillary)
approvals, pursuant to 30 V.S.A. secs. 107, 231, and 232)**

**NEW ENGLAND COALITION MEMORANDUM IN OPPOSITION TO MOTION TO
EXCLUDE TESTIMONY OF RAYMOND SHADIS AND ARNOLD GUNDERSEN**

INTRODUCTION

The New England Coalition (NEC) submits this Memorandum in opposition to Joint Petitioners' Objection to the Admissions of Certain Prefiled Testimony and Exhibits and Motion to Exclude. Joint Petitioners argue that Mr. Shadis is not qualified to express expert opinions about any of the topics on which he has presented testimony. Joint Petitioners also argue that Mr. Gundersen has no basis for certain of his opinions because, having examined the proprietary discovery documents, Mr. Gundersen determined they were not useful and did not rely upon them.

Mr. Shadis has been recognized as an expert on decommissioning issues by numerous tribunals and agencies, including the Nuclear Regulatory Commission. The Vermont Public Utility Commission itself has, in prior proceedings, rejected similar attempts to exclude Mr. Shadis's testimony.

Mr. Gundersen's extraordinary expertise is not challenged by Joint Petitioners. In the exercise of his expert judgment, Mr. Gundersen reviewed the two proprietary exhibits and concluded that they were not useful. Joint Petitioners disagreement is not grounds for excluding his testimony.

MR. SHADIS' EXPERIENCE, HIS TESTIMONY AND EXHIBITS

Mr. Shadis has submitted his resume as Exhibit 1 to his prefiled testimony, supplemented by pages 2-4 of his prefiled testimony and now an affidavit. His experience includes: 38 years of study of nuclear operations, nuclear safety and nuclear decommissioning, including attendance at American Nuclear Society technical conferences on decommissioning; participation in an Oak Ridge Associated Universities Manager's Training Course in the Multi-Agency Radiation and Site Survey Investigation Manual (MARSSIM); testimony on nuclear operation, safety and decommissioning in proceedings of the Maine Public Utilities Commission, the Maine Board of Environmental Protection, the Connecticut Department of Public Utility Control, the Nuclear Regulatory Commission, the Federal Energy Regulatory Commission and this Commission; participation by invitation of the State Department, the Nuclear Regulatory Commission, and various public utilities in national and international proceedings (including invitation by the NRC to participate in development of an NRC Staff technical report (NUREG-1738) on spent fuel pool accident risk in decommissioning nuclear power plants, NRC reactor oversight proceedings, and NRC proceedings on reactor safety and spent fuel pool accident risk); and receipt of paid invitations and foundation awards to present at international conferences on the effects of the Chernobyl nuclear accident in Kiev, and, most recently, at the International Conference on Decommissioning 2017, in St. Petersburg.

Mr. Shadis has been employed as Technical Advisor to the New England Coalition for 19 years; 1979 to 2006 as Staff Technical Advisor, and 2006 to the present as Consulting Technical

Advisor. As stated in his prefiled testimony and affidavit, his duties have included tracking and reading nuclear power plant operational and compliance documents, regulatory issuances, and power industry journals. It was his 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. While in performance of these duties, nuclear safety issues which he isolated and identified were granted relief in two 10C.F.R.2.206 Enforcement Requests. In all, more than six of his Enforcement Requests were accepted by NRC Staff as having sufficient technical basis for review. He conducted extensive review of both the Seabrook and Vermont Yankee Environmental Impact Statements, as issued for license renewal. As part of his job, he also performed in-depth review of the Maine Yankee, Yankee Rowe, and Connecticut Yankee License Termination Plans, as well as the Yucca Mountain Environmental Impact Statement.

Given that Joint Petitioners challenge Mr. Shadis's competence to address radiological safety, the NRC's recognition of his competence in this area is noteworthy:

- In 2000 and 2001, Mr. Shadis was invited at NRC's expense to present in breakout sessions at NRC's Annual [three day] Regulatory Information Conference(s) in Washington, D.C. and Rockville, MD. His assigned topics were Reliance on Corrective Action Programs, Industry Voluntary Initiatives Program, and Public Participation in Decommissioning. Approximately 1800 industry executives, managers, technicians and engineers together with representatives of foreign nuclear regulators and industry official were in attendance for the general session. This event is NRC's world showcase. In general session, he engaged in public dialogue on regulatory issues with NRC Chairmen, Commissioners, and Executive Directors of Operation.

- Mr. Shadis served on the Initial Implementation Evaluation Panel of the Reactor Oversight Process. This was a FACA (Federal Advisory Committees Act) invitation. He was invited, at NRC expense, to present his perspectives on the findings of the Initial Implementation Evaluation Panel of the Reactor Oversight Process to a meeting of the full NRC. He was also invited in 2002, again at NRC expense, to return to the NRC headquarters to participate in technical Reactor Oversight Panel evaluation task group investigating the (Risk) Significance Determination Process.

The NRC Corrective Action Program that the NRC invited Mr. Shadis to provide his opinions about is “the system by which a utility finds and fixes problems at a nuclear power plant.” As set forth on the NRC website, a Corrective Action Plan “includes a process for evaluating the safety significance of the problems, setting priorities in correcting the problems, and tracking them until they have been corrected.¹” In other words, the NRC invited Mr. Shadis to address issues that included how to evaluate the significance of radiological contamination at nuclear power plants and how to respond to that radiological contamination.

The Reactor Oversight Process which the NRC asked Mr. Shadis to discuss is the NRC’s “program to inspect, measure and assess the safety and security performance of operating commercial nuclear reactors, and to respond to any decline in their performance². The Significance Determination Process is the process used by NRC staff to “evaluate inspection findings to determine their safety significance. This involves assessing how the inspection findings affect the risk of a nuclear plant accident, either as a cause of the accident or the ability of plant safety systems or personnel to respond to the accident.³” That is, the NRC invited Mr. Shadis to address issues that included the causes of and responses to radiological contamination incidents at nuclear power plants.

While these NRC-sponsored roles involved radiological safety and contamination during plant operation and during decommissioning, Mr. Shadis has gained widely recognized experience and expertise pertaining to nuclear plant decommissioning more generally (as described in his resume, prefiled testimony and affidavit). He served on the Maine Yankee Community Advisory Panel on Decommissioning from 1997 through 2005; he is intimately knowledgeable of the details

¹ <https://www.nrc.gov/reading-rm/basic-ref/glossary/corrective-action-program.html>.

² <https://www.nrc.gov/reactors/operating/oversight.html>.

³ <https://www.nrc.gov/reading-rm/basic-ref/glossary/significance-determination-process.html>

of the decommissioning of the Maine Yankee plant, from start to finish. During the Maine Yankee decommissioning, Mr. Shadis participated in more than forty Maine Yankee technical working group meetings that helped design, execute, and oversee the dismantlement and decontamination of the Maine Yankee facility. He has been invited by the NRC and by utilities to speak at conferences on decommissioning. He has attended American Nuclear Society technical conferences on high-level radioactive waste and decommissioning, as well as a TLG/Entergy conference on decommissioning. In 2014, he was an invited presenter at the State Department-funded International Roundtable on Decommissioning. Also in 2014, the Legislature of Leningrad Oblast, Russia presented him an award for his global contributions to nuclear decommissioning. Most recently, in September of 2017, he and his long-term colleague Michael Meisner, the former CEO and Chief Nuclear Officer of Maine Yankee Atomic Power Company, were invited co-presenters at the second international conference on decommissioning sponsored by Decommission, LLC of Saint Petersburg, Russia, together with representatives of Rosatom and the decommissioning reactors at Ignalina, Lithuania.

In 2002, *Investigation into General Order 45 Notice filed by Vermont Yankee Nuclear Power Corporation re: proposed sale of Vermont Yankee Nuclear Power Station and related transactions*, Docket 6545, Vermont Yankee filed a motion to bar Mr. Shadis from testifying about the operational status of the facility and about radiological safety. In its Procedural Order (Jan. 31, 2002), the Commission rejected the motion:

Vermont Yankee objects to Mr. Shadis's testimony between pages 12 and 18 concerning the current operational and safety status of Vermont Yankee, arguing that Mr. Shadis lacks the requisite expertise to testify on these issues.

In order to be considered an expert, one must possess special knowledge, skill, training or education that could assist this Board in understanding the issues before us. As Vermont Yankee has recognized at page eight of its filing, Mr. Shadis is an

"activist who has been involved over the years in efforts to shut down Maine Yankee." At page two of his prefiled testimony, Mr. Shadis has described himself as a Staff Advisor to the Coalition whose responsibility it is to "identify, track, and address nuclear safety and environmental issues at New England's five operating and four decommissioning nuclear power stations." He is also a member of the Maine Yankee Atomic Power Company Community Advisory Panel on Decommissioning, and has held that position since 1997. This experience, in our view, constitutes sufficient knowledge of matters that could assist the Board in understanding the issues before us. Of course, the level of Mr. Shadis' experience will go to the weight that we give his testimony.

In 2006, in *Petition of Vermont Department of Public Service for an investigation into the reliability of the steam dryer and resulting performance of the Vermont Yankee Nuclear Power Station under uprate conditions*, Docket No. 7195, Entergy filed a motion asking that Mr. Shadis' prefiled testimony be stricken. Entergy argued that Mr. Shadis was "not qualified to give expert opinion regarding physical characteristics, mechanics, reliability or related engineering issues about Entergy VY steam dryer," which was the subject of question and answer number 8. ("Objection to Admission of Prefiled Direct Testimony and Exhibits of Raymond Shadis," pp.1-2, 6)

The Commission overruled the objection by oral ruling on December 18, 2006. The Commission stated: "And as to Mr. Shadis's qualifications, we are aware of what his qualifications are, and if, in fact, they have limitations in certain areas that will go to the weight of his testimony and certainly there is the ability to object to specific pieces of evidence as they come in if you feel it's over and above anything he might have the ability to speak to. We are not going to describe [sic] it in general. We will allow it subject to your cross." 12/18/06 trans.p.23. Later the Commission repeated that as to question and answer number 8, the ruling was "Weight rather than exclusion." 12/18/06 trans. P.24. The Commission struck only Mr. Shadis's quotation of another, non-testifying witness.

Nevertheless, Joint Petitioners have moved to strike all of Mr. Shadis's testimony in the present matter, arguing that Mr. Shadis lacks the competence to testify about radiological safety, decommissioning and how the decommissioning decision-making process should proceed. The motion should be denied. Mr. Shadis's prefiled testimony was based on his extensive education and experience.

Questions 1-6 – Mr. Shadis's background and NEC's position. Mr. Shadis's answers to Questions 1-6 discuss his background and NEC's position.

Questions 7-10 and Shadis Exhibit 2 – lessons from the Maine Yankee decommissioning process, and Mr. Holschuh's statements. Questions 7-10 and **Shadis Exhibit 2**, are explicitly based upon Mr. Shadis's experience as a participant in the Maine Yankee decommissioning regulatory process. The regulatory process in Maine resulted in a successful, on-time, on-budget, community and stakeholder-supported decommissioning of a nuclear plant of comparable size and age to Vermont Yankee. To achieve the same result in Vermont, Mr. Shadis explains that it would be most constructive to first consider the proposed end state of the decommissioning process and then to evaluate Joint Petitioners' proposal from that perspective -- as was done in Maine.

With respect to 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 interveners (stakeholders) might be. Put another way, we can best judge proposed actions if we know what they are intended to accomplish.

His testimony then proceeds to explain, issue by issue, how to benefit from the Maine example, by starting with a decision about the desired end state. He points out that, to date, "...

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.” (p.12) In Maine, Maine Yankee agreed to set aside 200 of its acres for a nature preserve and center. A nature preserve setaside was also obtained in Connecticut. All of these facts are well within Mr. Shadis’s expert knowledge and experience. Based on this knowledge and experience, he suggests the same outcome in Vermont.

In discussing what the end state should be at the Vermont Yankee site, Mr. Shadis brings to the Commission’s attention five publicly available documents – the Electric Power Research Institute (EPRI) report on Maine Yankee decommissioning; the Environmental Impact Statement (EIS) for Vermont Yankee’s license renewal, the designation by the United States Secretary of the Interior of the Connecticut River Watershed as a “Blueway,” the website for the Connecticut River Paddlers Trail, and a press release by the Outdoor Industry Association on the economic value of outdoor recreation.

The first document, the EPRI report, **Shadis Exhibit 2**, fleshes out in more detail the same subject matter as Mr. Shadis’s testimony, about which Mr. Shadis possesses exhaustive first-hand information – what the process in Maine consisted of, and why it succeeded. Mr. Shadis could have eliminated the EPRI report and added many pages to his testimony instead. It is, in effect, a report which he incorporated into his own testimony to efficiently present his testimony, all of which he possesses first-hand information about. It is common practice for experts testifying before the Commission to attach reports the contents of which they are personally familiar with, rather than relying exclusively on question-and-answer prefiled narrative. It is the opposite of so-called “conduit” testimony, in which an expert tries to introduce into the record the opinion of

another expert in an area in which the first expert is not competent. *Dupona v. Benny*, 130 Vt. 281, 287, 291 A.2d 404, 408 (1972)

Mr. Shadis' attached affidavit explains that the EPRI report is a reliable source of information, of the type referred to by experts in the decommissioning of nuclear-powered electric generating plants. This Commission itself has relied on EPRI reports. *Board Investigation into Load Response Programs for Vermont Electric and Gas Utility Companies*, Docket No. 6555 Order Opening Investigation and Notice of Hearing (9/18/01), n.1; *Joint Petition of Vermont Electric Power Company, Inc., Vermont Transco, LLC, and Central Vermont Public Service Corporation for a certificate of public good pursuant to 30 V.S.A. § 248, authorizing the construction of the Southern Loop Transmission Upgrade Project*, Docket No. 7373, Opinion (2/11/09), Findings of Fact #65, 295. **Shadis Exhibit 2**, the EPRI report, is admissible under V.R.E. 703 and 3 V.S.A. § 810.

The other four documents are not offered as exhibits. They are cited to illustrate Mr. Shadis's point about "end use." It is important to note that Mr. Shadis is testifying about potential future land uses, but he is not providing expert testimony on aesthetics or planning or economics. He is not offering an opinion that the Vernon site has high or low aesthetic value, or an opinion under the Quechee test, or an opinion that setting the land aside as a preserve would provide the greatest economic benefit. The four documents help illustrate or explain what the future use could be and the potential benefits of setting aside the land as a preserve, including potential economic benefit (his testimony is that allowing the ground to lie fallow would have benefits and "may" provide economic benefit greater than an industrial use). He relies primarily upon his experience in Maine and Connecticut, where portions of the sites of former commercial nuclear power plants

in fact were set aside as preserves -- an alternative Joint Petitioners have not considered, and which its proposed future use forecloses.

NEC notes that these four documents are each documents that the Commission could admit into evidence regardless of any witness's testimony, under Vermont Rule of Evidence 201⁴ and Vermont Administrative Procedure Act § 810.⁵ Therefore, regardless of whether Mr. Shadis is an expert in environmental impact statement review, or Blueway designation, or Connecticut River recreational use, or the economic benefits of outdoor recreation, there is no prejudice to the Petitioners from Mr. Shadis's reference to them.

Joint Petitioners' Objection challenges "the entire testimony of Mr. Shadis" and states "he is not an expert in any of the topics on which he has presented testimony." Objection pp.2, 4. However, the Objection does not address his answers to Questions 8-10 other than to object to his reference to these five documents, and to statements made by Richard Holschuh. Objection pp. 6, 10. The EPRI document is properly attached, and the other four documents are properly referenced by Mr. Shadis, for the reasons stated above.

⁴ The contents of these four documents are not subject to reasonable dispute, and are admissible under VRE 201(b). The EIS and the Secretary's designation are official government documents, the contents of which are capable of accurate and ready determination by resort to sources whose accuracy cannot reasonably be questioned. The CRPT and OIA documents contain facts which are generally known within the territorial jurisdiction of the Commission – such as the river access points in the area of the site and the generally acknowledged economic benefits of outdoor recreation. The State of Vermont's website is to the same effect – see <http://fpr.vermont.gov/VOREC>, where the Department of Fish & Game reports that outdoor recreation consumer spending adds \$2.5 billion each year to the Vermont economy.

⁵ Each document also is a type of document commonly relied on by reasonably prudent persons in the conduct of their affairs. It would not be practical to obtain the authors of these documents to testify as to the authenticity and contents of each document, and it should not be necessary to do so. Section 810 authorizes the Commission to admit them, in its discretion.

As to Mr. Holschuh's statements, Mr. Shadis's experience with and expertise about public involvement in nuclear decommissioning justify his reliance on these statements under the second sentence of V.R.E. 703. This is the type of information relied on by persons experienced in planning the decommissioning of a nuclear plant. However, reliance on those statements is no longer necessary now that Mr. Holschuh has submitted testimony. Instead, Mr. Shadis relies on Mr. Holschuh's testimony in this matter. The New England Coalition is filing a motion, concurrent with this memorandum, seeking to amend Mr. Shadis's testimony to refer to Mr. Holschuh's prefiled testimony rather than to these statements. This occurs in responses 8 and 15 (pp. 7-8 and 25).

Questions 11, 12, 13 and 15 – radiologic risk, rubblization and Shadis Exhibit 5. Mr. Shadis discusses in Answer 11 the half-lives of the radionuclides found at the Maine Yankee site and likely to be found at the Vermont Yankee site, and the scientific consensus that expiration of ten half-lives is a reasonable safety standard. Understanding and application of this information was central to Mr. Shadis's work at Maine Yankee and his participation in NRC proceedings. In Answer 12 he discusses the mrem/yr standards imposed by other states. He discusses in Answer 13 the meaning and effect of the 10, 15 and 25 mrem/yr residual radiation levels, and in Answer 15 how nuclear power plants are "scabbled" and the radiological risks of rubblization. Each of these opinions is based upon his in-depth experience and education, throughout and after the Maine Yankee decommissioning process, including participation in the Oak Ridge training and American Nuclear Society and TLG/Entergy technical conferences, and presenting to the NRC and to two international conferences on the radiological risks of decommissioning.

Although Joint Petitioners allege that Mr. Shadis has no expertise in radiological contamination (Objection pp.4-5), their objection does not refer to the relevant sections of his

resume or testimony which describe his experience and education in this area. Mr. Shadis brings to bear experience and education regarding radiological contamination and risk, summarized above, that more than satisfies Vermont Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 2793, 125 L. Ed. 2d 469 (1993). His decades of in-depth hands-on experience and education, coupled with his review of all of Joint Petitioners' plans, testimony and discovery, allow him to provide testimony that is (1) based upon sufficient facts and data, (2) the product of reliable principles or methods, and (3) the result of reliable application of the principles or methods to the facts of the case. V.R.E. 702.

In *Capiallo v. Northrup*, 157 Vt. 317, 319-321, 552 A.2d 415 (1988), decided five years after the Vermont Supreme Court held that *Daubert* applies to Vermont Rule of Evidence 702, the Court held that a farmer without any professional education or licensing as a veterinarian, but with decades of experience, was competent under Rule 702 to testify in rebuttal of a veterinarian who had testified that consumption of bracken fern in haybales caused horses to become ill and die. The farmer had not examined the horses. He made clear his lack of any professional education and training. He testified that, based purely on his own experience, eating bracken fern does not cause harm to horses. Unlike Mr. Shadis, the farmer had received no recognition of his expertise in the area of his testimony by any government agency or professionals, nor had the farmer attended any technical education or training sessions in the area of his testimony. The jury accepted the farmer's opinions over that of the veterinarian. The Supreme Court affirmed, primarily on the basis that the trier of fact was well aware of the limitations of his expertise and therefore his testimony did not unreliably affect the trial.

The main goal of the trial court in considering the admission of expert testimony under V.R.E. 702 is to avoid the possibility of misleading the jury by allowing a witness to enjoy greater credence than his qualifications would otherwise allow.

Where an expert's limitations are made clear, both on direct testimony and cross-examination, the court may not be said to have abused its discretion in allowing the testimony.

157 Vt. 319.

USGen New Eng., Inc. v. Town of Rockingham, 2004 VT 90 ¶¶ 38-39, 177 Vt. 193, subsequently applied *Capiallo*. In *USGen*, the trial court relied on the testimony of Richard Silkman to determine the property value of the USGen generating station. Silkman held a Ph.D. in economics, was experienced in utility markets, had taught a course on valuation of assets using the income capitalization method, and had appeared as an advocate for his own energy business interests in front of regulatory agencies -- but he was not a licensed appraiser, had no training or prior experience in appraising and did not even have any familiarity with the standards governing appraisals (the Uniform Standards of Professional Appraisal Practice). His testimony conflicted with that of a licensed appraiser. Nonetheless, the Court affirmed admission of his testimony, and the trial court's reliance on his testimony and rejection of that of the licensed appraiser, because the trial court was aware of the limits of Dr. Silkman's expertise, and therefore his testimony would not be misleading. Quoting *Capiallo*, the Court held: "If an expert's limitations are clear, both on direct testimony and cross-examination, 'the court may not be said to have abused its discretion in allowing the testimony.'"

Here, Mr. Shadis has been explicit in setting forth the limitations of his expertise. His resume states that he has a degree in art, and then sums up what this artist has to offer the Commission: "Raymond Shadis has, since the seminal event of the Three Mile Island nuclear accident, engaged in 38 years of self-directed, focused study of nuclear operational and regulatory issues." During those 38 years he has been an active participant in the regulatory process governing the decommissioning of Maine Yankee. As a result, he has gained national and

international recognition, by public utilities and government agencies, for his knowledge of the issues that arise during decommissioning, including radiological contamination and safety. His opinions will not mislead this Commission. The fact that he has no professional degree or license will be relevant to his credibility. The Commission may, like the jury in *Capiallo* and the trial judge in *USGen*, conclude that some or all of Mr. Shadis' testimony is more credible than that of a professional witness; the Commission may also conclude that it is less credible. That decision should be made on the basis of the entire record, including cross-examination of Mr. Shadis and of the professional witnesses.

In connection with his testimony explaining how rubblization was initially proposed, and then withdrawn, by Maine Yankee, Mr. Shadis cites to the cross-examination testimony of Uldis Vanags in Docket 7440 (in which Entergy sought permission to extend its operating license). (Shadis PFT p.27). This transcript is **Shadis Exhibit 5**. In the transcript, Entergy VY's lawyer asked about how rubblization was addressed at Maine Yankee. Mr. Vanags explained that Maine Yankee had agreed to avoid leaving any rubblized concrete on the site. Entergy VY's lawyer then asked: "And we agree that Entergy Vermont Yankee has accepted that standard, correct?" Mr. Vanags, Vermont's nuclear engineer responsible for oversight of VY replied, "Yes."

Joint Petitioners have not objected anywhere in their memorandum to **Shadis Exhibit 5**. Their objection appears only in their Appendix B. The Appendix does not explain why this exhibit is inadmissible.

Shadis Exhibit 5 is admissible under V.R.E. 801(d)(2)(B). Attorney Marshall's solicitation of testimony that Maine Yankee had agreed to not use rubblization, and his solicitation of testimony that Entergy had agreed to the same commitment, are statements as to which Entergy has manifested its adoption or belief in the truth under V.R.E. 801(d)(2)(B). By definition, they

are not hearsay when offered against Entergy, as they are being offered here. Attorney Marshall's question/statement ("And we agree that Entergy Vermont Yankee has accepted that standard, correct?") was also a statement by the agent of a party opponent, and is admissible under V.R.E. 801(d)(2)(D).

Joint Petitioners also object to quotation from a letter submitted by the then-EPA Administrator Carol Browner to the NRC, and to a report from the National Academies of Science on the Biological Effects of Ionizing Radiation. The EPA letter is posted on NRC's official "ADAMS" library of documents. The National Academies are the preeminent scientific panels in the United States; they exist to report to the Congress. The study (as Mr. Shadis's testimony explains) was supported by the EPA, the NRC, the Department of Commerce and the National Institute of Standards and Technology Grants. Both documents are classic examples of a type of document "reasonably relied upon by experts in the particular field [here, decommissioning] in forming opinions or inferences upon the subject." V.R.E. 703 (second sentence). Therefore, it is appropriate for Mr. Shadis to rely upon both.

It is also appropriate for Mr. Shadis to share the contents of the EPA letter and the National Academies report with the trier of fact (the Commission) because its "probative value substantially outweighs any prejudicial effect." V.R.E. 703 (third sentence). The information is from a reliable source and is probative of the proper mrem standard for the end use of the site. The information has no prejudicial effect, since it comes from impeccable government sources and Joint Petitioners have been given the opportunity to file rebuttal if they believe the information is inaccurate.

Both the EPA letter and the National Academies report also are admissible under § 810. Each document is a type of document commonly relied on by reasonably prudent persons in the

conduct of their affairs. It would not be possible to obtain the authors of these documents to testify as to the authenticity and contents of each document.

Joint Petitioners also object to quotation from an email from the New Jersey Department of Environmental Protection Bureau of Radiation. (Shadis PFT p. 16). The email refers to New Jersey's statutory limit of 15 mrem/yr for soil. That limit is publicly available in New Jersey's statutes. The reason Mr. Shadis cites the email is that it illustrates his point that in New Jersey, the same as in Maine, the state takes the position that its radiological standard goes into effect *when decommissioning has been completed, after the NRC license has been terminated*. NEC recognizes now that the prefiled testimony does not make this sufficiently clear, so NEC is moving to amend that page. The email is not being offered to prove what the New Jersey standard is but that the state takes the position that its standards come into play once the NRC license has been terminated. The email is the type of information that experts in the decommissioning process, such as Mr. Shadis, rely on in determining the nature and scope of state review of decommissioning.

Questions 14 – unexpected costs, Dr. Irwin's Affidavit, the NRC Staff Report and Shadis Exhibits 3 and 4. In Answer 14, Mr. Shadis sets forth his concern that NorthStar lacks adequate information to predict the potential costs of decommissioning and has not demonstrated the financial strength to respond to large cost increases. Mr. Shadis explicitly refers to and relies upon his experience in Maine, and the information he gained about decommissioning Connecticut Yankee while working on the decommissioning of Maine Yankee. Mr. Shadis is competent to provide this testimony.

Mr. Shadis also cites and provides as **Shadis Exhibit 3** an affidavit from William Irwin which was submitted to the NRC. Dr. Irwin's affidavit states that NorthStar's decision to defer a full site investigation and characterization calls into question all of NorthStar's cost estimates. Mr.

Shadis states that “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.” Mr. Shadis then states that Maine Yankee, unlike Vermont Yankee, was a rate base plant. A rate base plant can seek to recover additional costs in rates, if needed, but NorthStar will not be able to do so.

As with Mr. Holschuh’s statements, NEC submits that Mr. Shadis’s reference to Dr. Irwin’s out-of-court statement was proper under the second sentence of V.R.E. 703 but is no longer necessary in light of the prefiled testimony. The prefiled testimony of witnesses Gerold Noyes, Chuck Schwer, Warren Brewer and Gregory Maret covers the same ground as Dr. Irwin’s affidavit and does so in more detail. The parties need not litigate this issue. NEC therefore is filing a motion to amend this portion of Mr. Shadis’ testimony to refer to the pre-filed testimony of witnesses Noyes, Schwer, Brewer and Maret, and to strike the quotation from and attachment of Dr. Irwin’s affidavit.

Mr. Shadis’s testimony will be that, based on his experience at Maine Yankee, he concurs with the testimony of witnesses Noyes, Schwer, Brewer and Maret, and he adds that, unlike the decommissioning of Maine Yankee, ratepayers will not be available to pay the unexpected cost increases that may arise during the decommissioning of Vermont Yankee.

Mr. Shadis also quotes from a NRC Staff report on the risks that limited liability companies may lack the resources, as stand-alone entities, to fulfill decommissioning obligations (p.24). The report in turn is quoted on pages 15-16 of a report from Synapse Energy Economics, Inc., on the same subject, attached as **Shadis Exhibit 4**.

The NRC Staff report is a publicly available document issued by the NRC. An NRC staff report is another example of a type of document “reasonably relied upon by experts in the particular

field [here, decommissioning] in forming opinions or inferences upon the subject.” V.R.E. 703 (second sentence). Therefore, it is appropriate for Mr. Shadis to rely upon it.

It is also proper for Mr. Shadis to share the contents of the NRC report with the trier of fact because its “probative value substantially outweighs any prejudicial effect.” V.R.E. 703 (third sentence). The probative value is high, because the source is the NRC staff. There is no prejudicial effect, since the issue of the NorthStar LLC’s limited liability to pay for presently unknown decommissioning costs has already been the subject of prefiled testimony from NorthStar and Entergy and because NorthStar and Entergy have the opportunity to file rebuttal.

The Synapse report as a whole, **Shadis Exhibit 4**, will be offered by NEC as a cross-examination exhibit now that Joint Petitioners object to its admission as part of Mr. Shadis’s testimony. At present, NEC offers only pages 15-16, containing the citation to and a quotation of the NRC Staff report.

Question 16 – NEC’s position on the no-rubblization commitment. In answer to this question, Mr. Shadis does not testify as an expert. He testifies as NEC’s representative, voicing NEC’s strongly held position that Entergy’s commitment not to engage in rubblization, which was incorporated into a Commission order, remains binding on Entergy and on the proposed successor owner of the site, NorthStar.

ANR’s witness Chuck Schwer, in Answers 9 and 10, has articulated the same position on behalf of ANR – that the commitment not to engage in rubblization is binding on Joint Petitioners. Joint Petitioners have not objected to Mr. Schwer’s testimony.

Question 17 – NEC’s position on solid waste disposal. In answer to this question about solid waste disposal, Mr. Shadis again does not testify as an expert. He presents NEC’s position that rubblization requires a solid waste disposal permit under Chapter 159 of Title 10 of the

Vermont Statutes Annotated. ANR's witness Chuck Schwer has testified that a solid waste disposal permit is required, although he does not restrict his answer to rubbleization (Answer 8.)

Question 18 – NEC's position on fair partner. Mr. Shadis also presents NEC's position that NorthStar has not shown it is a fair partner. Again, Mr. Shadis is presenting NEC's position.

Summary re: Mr. Shadis's Exhibits. **Shadis Exhibit 2**, the EPRI study, should be admitted for the reasons set forth above. **Shadis Exhibit 3**, Dr. Irwin's affidavit, is being withdrawn for the reasons set forth above. **Shadis Exhibit 4**, the Synapse report on the use of Limited Liability Companies, is offered only with respect to pages 15-16, quoting the NRC Staff report, as explained above. **Shadis Exhibit 5** is admissible for the reasons set forth above.

MR. GUNDERSEN'S EXPERIENCE, HIS TESTIMONY AND EXHIBITS

Arnold Gundersen possesses extraordinary expertise in nuclear plant decommissioning. He has a Bachelor Degree and a Master Degree in Nuclear Engineering from Rensselaer Polytechnic Institute. He was an Atomic Energy Commission Fellow. He was one of the authors of the first edition of the Department of Energy's Decommissioning Handbook. He was a member of an NRC Licensee's Radiation Safety Committee responsible for decommissioning nuclear facilities throughout the United States. He has been a reactor operator. He has testified as an expert before the full NRC, the NRC's Atomic Safety and Licensing Board, and in numerous other tribunals in the United States and Canada. He has more than 45 years of experience in the nuclear power industry and in oversight of that industry.

Mr. Gundersen, like any other highly experienced expert, engages in his craft by reading and evaluating the reliability and usefulness of reports, studies and other documents. Those which he finds reliable, based on his 45 years of experience, he utilizes where relevant. Those reports,

studies other documents which he finds contain no useful information, he does not utilize. He exercises his education and experience to make those determinations.

In his answer to Question 7 of his prefiled testimony, he stated that the proprietary information NorthStar had prepared was not useful and therefore he did not rely on it in his testimony. In discovery, Mr. Gundersen was asked why he did not find the proprietary information useful. He explained why:

Q.JP:NEC.1-13: Explain why Mr. Gunderson did not find the proprietary material in this proceeding useful, as referenced in A.7.

Answer:

The alleged proprietary information reviewed by Mr. Gundersen contained hundreds of line items with costs that appeared to be forced to achieve the desired outcome. On repeated occasions throughout the list, several sequential line items contained financial costs that were identical to those items listed before and after it, that when added together produced a round number. This indicated to Mr. Gundersen that the round number answer was preordained and then divided evenly between subtasks and spread over several years. Furthermore, there were no detailed engineering cost justifications provided for the values Mr. Gundersen reviewed, therefore without the appropriate engineering details on which the costs were assessed, there was no accurate engineering or cost submittals to review.

Joint Petitioners cite no precedent for excluding the testimony of a witness with uncontested competence in the field of his testimony on the grounds that the witness, in exercising his expert opinion, determined that certain exhibits submitted in pretrial discovery were not useful. Our Supreme Court has warned trial tribunals not to venture down this path.

Given the “general approach [of the rules of evidence] of relaxing the traditional barriers to ‘opinion’ testimony,” [Brooks, 162 Vt. at 30, 643 A.2d at 229](#) (citation omitted), the trial court's inquiry into expert testimony should primarily focus on excluding “junk science” — because of its potential to confuse or mislead the trier of fact — rather than serving as a preliminary inquiry into the merits of the case.

985 Assoc., Ltd. v. Daewoo Elecs. Am. Inc., 2008 VT 14 ¶ 9, 183 Vt. 208, 945 A.2d 381.

The facts and the opinion in *985 Assocs. Ltd.* cannot be distinguished from Joint Petitioners' attack on Mr. Gundersen. The trial court in *985 Assoc. Ltd.* excluded expert testimony because the expert had not consulted a report that the Burlington Fire Department had prepared about a fire, and had not personally examined the microwave oven that the expert believed was at fault for the fire. The Court ruled this was properly the subject of cross-examination, not exclusion. The expert's "failure to read the report or examine the internal workings of the microwave is an issue subject to cross-examination, but does not render his opinion inadmissible under Rule 702." *985 Assoc.* ¶ 12. The Supreme Court reversed.

Joint Petitioners not only seek a ruling contrary to Vermont precedent, they grossly mischaracterize Mr. Gundersen's testimony. They allege (p.7) that "instead" of relying on the proprietary documents, "Mr. Gundersen relies on a 17-year old press release, an outdated decommissioning cost estimate, and email from January 2011..." This means that Mr. Gundersen chose the facts in the press release, the outdated cost estimate and the email *instead of* the facts in the proprietary documents.

This assertion is frivolous at best. The facts in the press release, the cost estimate and the email bear on *another part of Mr. Gundersen's testimony*. The press release is Entergy's own press release praising the work of TLG. The "outdated" cost estimate is Entergy's and it was performed in 2012. The email pertains to whether an NRC exemption is necessary in order to use decommissioning funds for ISFSI. Each document pertains to whether Entergy could provide the same services, on the same schedule, as NorthStar proposes. They have *nothing* to do with Mr. Gundersen's determination that the proprietary documents were not reliable sources of information. They have *nothing* to do with whether the hundreds of line items in the documents

were preordained round numbers that were divided evenly between subtasks instead of being justified by detailed engineering cost justifications (which they were not).

Based on a legal approach the Supreme Court has rejected, and on mischaracterization of the facts, Joint Petitioners' Appendix A requests that most of Mr. Gundersen's testimony be stricken. Appendix A asks that Answers 8, 9, 10 14 16, and subparts 1 3 and 4 of 19 be stricken.

Answers 8, 9 and 10 do not pertain to the facts in the proprietary documents; they set forth the basis for Mr. Gundersen's conclusion that sufficient funds would be available for *Entergy* to completely decommission the Vermont Yankee power plant by 2032. Joint Petitioners provide no explanation for why, even if legitimate, their complaint about Mr. Gundersen has anything to do with Answers 8, 9 and 10.

Answer 14 along with Answer 13 does pertain to the hundreds of proposed contracts, and they explain why the listing of contracts in the proprietary documents is unreliable. Mr. Gundersen explains why the Vermont Yankee site is likely to present challenges that NorthStar has not anticipated.

The decommissioning of Vermont Yankee will be the first attempt by any contractor in the U.S. to dismantle a Boiling Water Reactor. Most importantly, the Vermont Yankee site is known to be radiologically contaminated by Cesium 137, Cobalt 60, Strontium 90, and tritium that were created by Entergy when VY was producing electricity. Furthermore, NorthStar has never dismantled a large atomic power reactor, let alone a large BWR on a site that is contaminated by radioactivity and adjacent to a major river and aquifer.

(p.13). He goes on to explain in detail that NorthStar's approach is unique and "very naïve." It proposes to issue hundreds of fixed-price contracts to numerous different independent contractors. "Rather than own and manage the actual decommissioning, NorthStar appears to consider itself as the contract administrator on an extraordinarily complex process that has never been undertaken before on a BWR." (p.13) Fixed-price contracting, Mr. Gundersen explains, "requires an extremely

detailed and well-defined understanding of the scope of each of hundreds of individual contracts and the radiological and mechanical responsibilities of each contract as well as for the site as a whole.” NorthStar’s proposal to bond each contractor “is an impossible task if the work scope is not well-defined,” and the prefiled testimony and discovery demonstrated to Mr. Gundersen, based on his 45 years of experience, that the work scope is poorly understood and incomplete. (p.14). Again, if Joint Petitioners wish to challenge Mr. Gundersen’s application of his training and experience to NorthStar’s unique proposal, they have every right to do so during cross-examination.

Answer 15 contains Mr. Gundersen’s detailed explanation of NorthStar’s misunderstanding and underestimation of the extent of radioactive contamination at the site. The hundreds of line items in the proprietary documents are based upon the contamination that NorthStar *does* recognize. NorthStar does not explain why Mr. Gundersen’s discussion of the risks NorthStar has not recognized is undermined by his determination that these line items, based on the risks they have recognized, are unreliable.

Answer 16 answers the question: “Who is financially liable for the complete radiological decommissioning of Vermont Yankee?” This too has nothing to do with whether Mr. Gundersen discarded the proprietary documents as unreliable.

Answer 19 summarizes Mr. Gundersen’s testimony. Subpart 1 summarizes Answers 8, 9 and 10. Subpart 3 summarizes Answers 13 and 14. Subpart 4 summarizes Answer 16. There is no basis for striking any of these.

Three documents referred to by Mr. Gundersen; two are withdrawn. Joint Petitioners object to Mr. Gundersen’s reference to an email, a Keene Sentinel excerpt, and a Time Argus excerpt.

The email sets forth the Department of Public Service's understanding, based on discussions with NRC staff, about the need for an exemption before decommissioning funds can be used for ISFSI. Joint Petitioners have not objected to the letter from Entergy to Assistant Attorney General Landis-Marinello, acknowledging the same principle, quoted on page 7. NEC agrees to withdraw the email on page 8.

The Keene Sentinel excerpt is not offered to prove that the site is contaminated with Strontium-90 and Tritium. Other documents (such as the one quoted on page 16, from Entergy) prove that. The newspaper article is submitted only to show that NorthStar was on notice of the contamination. (pp.17-18). The hearsay rule does not apply, since the documents are not offered to prove the truth of the allegations in the articles. Joint Petitioners have not articulated any reason to strike these articles.

The Times Argus articles quote NRC officials discussing potential parent corporation liability. NEC agrees to strike these references, on pages 20 and 21.

CONCLUSION

Shadis Exhibit 3, Dr. Irwin's affidavit, is being withdrawn for the reasons set forth above. **Shadis Exhibit 4**, the Synapse report on the use of Limited Liability Companies, is offered only with respect to pages 15-16, quoting the NRC Staff report, as explained above. The email from the Department of Public Service on page 8, and quotations from the Times Argus articles on pages 20-21 are withdrawn from Mr. Gundersen's testimony.

A motion to amend Mr. Shadis's prefiled testimony accompanies this memorandum. The motion seeks to replace his reference to Mr. Holschuh's statements by a reference to Mr. Holschuh's prefiled testimony, to replace the reference to Dr. Irwin's affidavit by a reference to

the prefiled testimony of witnesses Noyes, Schwer, Brewer and Maret, and to correct the reference to the email from the New Jersey Department of Environmental Protection.

The rest of their testimony and exhibits should not be excluded.

Dated at Bristol, Vermont this 23rd day of October, 2017.

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