Synapse
Energy Economics, Inc.

To: Catherine Benham, VT JFO

CC: Ezra Hausmann, Lauri Mancinelli, Bruce Lacy

From: William Steinhurst

Date: June 1, 2009; Updated June 10, 2009

Re: Brief summary of issues raised in Docket 7440 Technical Hearings

This summary of issues raised in the Technical Hearings for your information. I would be happy to discuss the hearings further with you.

Considerable discussion of Yucca Mountain issues. My interpretation: No credible insight possible as to when any spent fuel will leave the site even though Entergy decommissioning cost estimates assume an early pickup date. U.S. DOE *likely* to reimburse plants for spent fuel storage cost for fuel used post-1998 but not certain reimbursement will be 100% or timely.

Discussion of alternatives to continued reliance on ENVY. Wind's limitations highlighted along with proposition that a carbon constrained future will call for more electricity use. Board has asked several times about impact of new technologies for getting natural gas from oil shale.

Carbon Issues. Criticism of claim that ENVY has low carbon footprint, but not seriously damaged. Entergy witness Lester: Q: Is nuclear the solution to carbon crisis? A: The challenge is very serious, very challenging to achieve reduction goals and will likely need all available options, including nuclear and CCS coal. Taking any of those off the table -> very little chance of meeting goals. Significant new nukes will be needed. Q: How many and why not being built? A: Really have 2 objections: significant decrease in C emissions AND maintain reasonable rate of econ growth, so must increase energy efficiency or decarbonize energy production—to meet goals must do both much greater than managed so far. VT historical EE achievement not nearly enough. Keeping same rate of EE achievement, would still depend on renewables & CCS, but likely need more than twice current output from nukes even if renewables up to several 100 GW. So that's 2 hundred plants total? Q: SNF? A: Would increase but that a technically reasonable challenge. Scaling from 100 GW to 2 or 300 GW does not qualitatively change the technical challenge of SNF disposal. Q: enough uranium to support that scale of production? Not

likely to run into resource constraints over next several decades (so don't need reprocessing).

Plant aging issues and Reliability. My interpretation: claims that nukes will be highly reliable or totally unreliable during relicensing are in a dead heat but NRC happy to assume they will be reliable for purposes of checking decommissioning TF adequacy. Thayer agrees cooling tower issues showed "less than perfect" quality control and corrective action. This was a theme that cropped up from time to time. Board concerned about major component replacements planned or required to obtain license renewal or thereafter, especially replacing condenser. (Condenser not part of license renewal appl.) Discussion of adequacy of spare main transformer (only rated at 80% of full capacity and possibly of compromised reliability).

Plant security issues. Terrorism concerns mentioned once but no real debate on this.

Aesthetics. Various attempts to raise concerns about steam plume, stack visibility did not make a big impression. One issue that may stick is they don't compare visual impact of relicensing to not relicensing, only to existing situation. Relevant to Quechee standard? DPS recommends that Vermont Yankee be required to maintain the mature vegetative growth that presently provides some visual shielding for the cooling towers in order to prevent an increase in aesthetic impacts during any term of continued operation.

Air and water pollution. Same story as aesthetics on the whole. Considerable debate about whether plant is really emitting traditional pollutants at low enough level to avoid need for ANR permit, but not conclusive. Some tried to make hay with wetlands, rare and endangered species, thermal discharges to river, and traffic but got nowhere.

Decommissioning cost estimates, decommissioning fund adequacy. *Much, repeated discussion of loss of value recently, prompt decommissioning vs. SAFSTOR, reliance on current costs of goods and services (Entergy's witness on this, TLG, left it to Entergy to apply escalation), need for and cost of a 2nd spent fuel pad, and assumed growth rate of investments vs. escalation of decommissioning costs*. Some significant critiques of Entergy's decommissioning cost witness (Cloutier) and his firm (TLG); DPS witnesses on this also critiqued. Loss of access to Yucca Mountain also a serious concern (study assumes it will be available soon). Much debate about need for updates more than every 5 years. Some debate about proposed radiation standard tougher than NRC's. Re greenfielding, Entergy's proposed definition falls short of that in H.436. My interpretation: Board has record to go either way on demonstration of decommissioning TF adequacy and update frequency, but not sure what they could do or would have the stomach to do about it.

Spent Fuel Storage—other issues. Discussion of ability of cask design to last hundreds of years and that this is important given Yucca Mountain issues. Discussion of crane event and whether it represents a type of error that could have caused major problems with spent fuel. Inconclusive but potentially a big PR concern. Discussion of reliability issues relating to "full core offload capability" under various scenarios. My interpretation: gives

Board grounds for expressing concerns if desired. Board asked about monitoring casks for leaks and process for corrective action if any occur.

Economic impact. Some debate about limited number of scenarios considered (2012 shutdown vs. 2032 shutdown and only certain actions after shutdown). Evaluation of prompt decommissioning vs. SAFSTOR not comparable. Heaps agreed model results were good only to ± "10 or 20%." DPS witnesses on this were partially undercut by questioning.

RSA Benefit. Benefits limited to 10 years, no benefit if early shutdown, ENVY will not guarantee any benefit. Some real uncertainty created about size of that benefit. DPS witnesses on this were partially undercut by questioning. Another issue regarding the RSA is a disagreement about the interpretation of the original sale MOU language. The debate concerns whether the RSA will pay to VYNPC only the value of energy sold by the plant (in excess of the "strike price") or the value of energy plus capacity and other ancillary services. This is an issue of moderate economic importance.

PPA. Q: ENVY position is only way to get a PPA below market would be by applying RSA savings? A: Yes and still is. Q: Any other options? A: Yes. Q: What? A: Gets into confidential discussions, nothing else that is public. Q: Would Entergy close plant if PPA had to include more benefit? Can't say. Q: suppose NRC agrees to 20-year license, but PSB authorizes less than 20 years, is it Entergy position that RSA still exists on assumption that plant continues to operate? A: Yes, but continued operation would be problematic. Entergy would not promise PPA before end of case.

Financial assurances for decommissioning. Periodic review and annual contributions (per DPS proposal) not acceptable to ENVY. Board should rely on NRC supervision. Questions about support agreements and letter of credit. DPS witness Mullett raised concerns about bankruptcy and SNF damage claims.

Corporate Structure. Not very compelling questions about incentives to string out SAFSTOR to increase Entergy subsidiary income. Ditto for who Thayer works for and decision-making authority at ENVY. For Thayer: Re your auth to speak for Enexus, do you? yes. If Enexus acquires its shares of ENO and ENVY do board imposed obligation apply to Enexus? Absolutely.

Possible avenues for sidestepping RSA. DPS notes there are possible transactions that might allow ENVY to do so. DPS recommends conditions that (a) prohibit this type of transaction, (b) ensure access to data needed to detect such transactions, and (c) agreement that Board has authority to adjudicate disputes over RSA payments. Thayer was questioned very pointedly by GMP on this.

> Q: Does excess rev extend to a trans in which ENVY sells to an affil at below market rate and affil sells to a 3rd party at above market rate? A: Yes. Q: Does excess revenue include not only funds, but other consideration directly attributed to that sale? A: Yes. Q: Also apply to

trans in which the consideration was provided by someone other than purchaser? A: Yes. Q: Therefore, important to obtain all data necessary to assure excess rev's appropriate calc with respect to specific trans? A: Yes. Q: Re para 4 of MOU, last sent of para 2: Entergy to provide necessary data? A: Yes. Q: Does that go beyond ENVY to Entergy corp.? A: Yes. Q: So data would include valuation of any consideration other than cash? A: Yes. My interpretation: seems to commit them to address our concerns but need legal advice. [paraphrased]

Follow up on Act 160 and POP concerns. Discussion of matrix, other methods lengthy. My interpretation: Entergy position not unreasonable but to some extent amounts to "trust us." However, DPS engineer OK with it.

Sharing benefits with other utilities. Various positions. GMP said it's OK with them and DPS should decide how to do it. However, GMP proposes limiting sharing based on vague criteria.

Using RSA funds for EE/RE. If PPA achieved, GMP open to whatever form of sharing DPS deems appropriate. Other witnesses point out conflict with rate reduction objectives.

DPS Determination of compliance with *State Energy Plan*

DPS has not yet made that determination. It is typical in a complex case to reserve this decision until all the evidence is in. DPS notes that the *Plan* calls for a move towards non-carbon emitting resources while acknowledging that nuclear power is not 100% carbon free.

DPS Bottom Line Position

(Presented by witness Lamont)

DPS notes that "if Vermonters are going to bear the burdens associated with hosting this facility, there should be a direct relationship between its product and the electricity consumers in Vermont," and that the Board has issued a ruling to that effect in Docket 7156 when considering a permit for a wind facility. Lamont direct pft. at 23. DPS takes the position that without an appropriate PPA, relicensing fails the general good test in statute. An appropriate PPA is one providing more favorable terms than otherwise obtained on the market. Price is one major factor, also credit terms, other (unspecified) things Entergy can offer to utilities. Board should have such a PPA in hand before it issues a CPG. Loss of benefits and increased cost or risk of costs for Vermont in event of premature shutdown is one reason for this requirement; another is the "unique burdens" the plant imposes on the state—unique burdens require unique benefits. Tax payments and jobs provide economic benefits and, so, *support* a finding of general good but are not *sufficient*. Any value from the RSA to Vermont ratepayers has already been counted in determining the impact on the general good of the state in the sale case (Docket 6545). DPS also recommends "that Entergy be required to periodically [every 2.5 years] review the adequacy of the fund and make scheduled contributions, as necessary, to maintain the fund balance on a trajectory that would result in a fully funded decommissioning fund in

2032," including all costs of decommissioning, site restoration and spent fuel management. This issue is important enough to warrant quoting the proposed DPS condition:

> Entergy shall make annual contributions to the decommissioning fund beginning in March 2012 to insure the full funding of all decommissioning, spent fuel management and state-required site restoration costs no later than 2032 to allow for immediate decommissioning and site restoration to begin at the cessation of commercial operations. Entergy shall file a detailed report every three years, beginning in March 2012, demonstrating the adequacy of the fund to meet up-to-date decommissioning cost estimates using the most recent site specific decommissioning estimates available (see Vanags pft 2/11/09 at 14) and an analysis of historic and projected growth of the decommissioning trust fund. The Board will provide an opportunity for hearing any challenges to the reported information and shall make a determination as to the adequacy of the fund. To the extent that the fund is found to be insufficient or performing better than expected, the annual contributions required by Entergy will be adjusted to reflect that status. [Lamont direct pft. at 25.]

DPS also recommends requiring a "parental guarantee" from Entergy [the current parent corporation] to address the situation where the fund, after it is accessed by Entergy, proves to be inadequate to pay for all decommissioning, site restoration and spent fuel management costs.

One piece of equipment needed for the plant to provide power is the main transformer that converts the output of the plant's generator to high-voltage current that can be moved over the bulk transmission system. This is a very long lead-time item, so a spare transformer is kept on site. However, the spare is rated at only 80% of the plant's full capacity. This introduces an extra reliability concern. DPS recommends that Entergy arrange to hold Vermont ratepayers harmless against this contingency, either by contract or by putting a full size spare transformer in place. Note that this reliability issue impacts not only delivery of power to Vermont consumers, but also the potential for benefits under the RSA.