Supplemental Report of the Public Oversight Panel Regarding the Comprehensive Reliability Assessment of the Vermont Yankee Nuclear Power Plant

July 20, 2010

THE PUBLIC OVERSIGHT PANEL SUPPLEMENTAL REPORT

July 20, 2010

This report conveys our supplemental findings and recommendations in response to the letter of the Legislative Leadership of January 15, 2010 regarding events subsequent to our March 2009 report.

Peter Bradford Arnold Gundersen C. Frederick Sears

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1. INTRODUCTION

The Vermont Legislature required a comprehensive vertical audit and reliability assessment of Vermont Yankee in Act 189, enacted June 5, 2008. Act 189 created a Public Oversight Panel (the Panel). The original Panel members were appointed in July 2008 to work with the Department of Public Service (DPS) and its contractor, Nuclear Safety Associates (NSA) to implement Act 189.

During the fall of 2008 and the early winter of 2009 the Vermont Yankee Public Oversight Panel consisted of Peter Bradford, adjunct professor at Vermont Law School and former NRC Commissioner, appointed by former Speaker of the House Gaye Symington; Arnold Gundersen, Chief Nuclear Engineer of Fairewinds Associates, Inc, appointed by Senate President Pro-tem Peter Shumlin; William Sherman, former Vermont State Nuclear Engineer, appointed by Governor Jim Douglas; David Lochbaum, Director of the Union of Concerned Scientists Nuclear Safety Project, and Dr. Fred Sears, retired Director of the Pennsylvania State University Radiation Science and Engineering Center, were chosen by the Panel. Dr. Lawrence Hochreiter, a Pennsylvania State University professor of nuclear engineering, who was originally appointed by Governor Douglas, passed away in September 2008.

Mr. Lochbaum recused himself from the Panel in mid-February 2009 when he accepted employment with the Nuclear Regulatory Commission (NRC). NSA completed the Comprehensive Reliability Assessment (CRA) in late December 2008 and the Panel filed its report on the CRA with the Vermont Legislature on March 17, 2009. All four remaining panel members presented testimony to the Vermont State Legislature. The Panel took no further action between March 19, 2009 and January 15, 2010.[1]

Section 3 of Act 189 required "an in-depth inspection of at least seven whole plant systems" including "an underground piping system that carries radionuclides." As to this requirement, the March 2009 Panel report to the Legislature stated

> The Panel was informed that there were no systems with underground piping that

1 Mr. Gundersen continued to monitor Vermont Yankee in his capacity as a consultant to the Joint Fiscal Office of the Vermont Legislature through Fairewinds Associates.

> carry radioactivity at VY [*footnote omitted*]. Therefore the Panel recommended that the review of the service water system, Act 189 §3(6) ("a cooling system dependent upon Connecticut River water"), which has buried non-radioactive piping, specifically include a review of ENVY's Buried Pipe and Tank Inspection Program (Panel Report, page 15).

Similarly, the Comprehensive Reliability Assessment (CRA) stated,

> Act 189 included an in-depth inspection of 'an underground piping system that carries radionuclides'. However, there are no underground piping systems carrying radionuclides at ENVY. As an alternative and in agreement with the Department of Public Service and the Public Oversight Panel, the buried piping in the Service Water System was selected for a detailed examination of the ENVY underground piping inspection program. (Comprehensive Reliability Assessment, December 22, 2008, page 262)

In January 2010, radioactive tritiated water[2] was detected in a monitoring well on the Vermont Yankee site. This discovery suggested that an underground pipe containing radionuclides was leaking somewhere at the plant site. Thus the discovery of leaking tritiated water showed that both of the aforementioned statements were incorrect.

The Legislative leadership reconvened the Panel on January 15, 2010.[3] Of the four members who signed the 2009 Panel report, Sears, Bradford and Gundersen were available to participate in the reconvened panel. The DPS required NSA to supplement its original report to perform a vertical assessment of an underground piping system carrying radionuclides[4] and to assess the extent to which its original report had been compromised by inaccurate information.[5]

The Legislative leadership tasked the Panel to:

- Reexamine the conclusions of the March 2009 Report in light of the discovery of tritiated

2 Tritium is the radioactive isotope of hydrogen and is a gas. It combines with nonradioactive hydrogen and oxygen to form tritiated water, which is radioactive. Although the liquid leaks at Vermont Yankee are often referred to as "tritium", they are in fact tritiated water.

3 Letter of Senate President Shumlin and Speaker Smith, attached as Appendix A.

4 The NSA "Supplemental Report to the Comprehensive Reliability Assessment of Vermont Yankee" was submitted to the Department of Public Service April 30, 2010.

5 The NSA response was submitted in the form of a May 13 letter from Robert Frost to Sarah Hofmann, with an attachment.

water in the VY monitoring wells.

- Examine the root cause of the misleading information about radioactive underground pipes.
- Look at whether other information in the 2009 Panel Report may also be incorrect.

Each of these three questions is examined separately in Section 4 of this report.

Together the Panel, the DPS, and NSA determined that an additional plant system should be evaluated in order to meet the Act 189 requirement for an in depth inspection of "an underground piping system that carries radionuclides". The Panel, NSA and the DPS agreed that the Advanced Off Gas system (AOG) would be the best candidate for this inspection. Furthermore, the Panel, NSA and the DPS agreed that a horizontal assessment of Entergy's Buried Pipe and Tank Inspection Program (BPTIP) was also necessary because the leak of tritiated water at VY might indicate overall weakness in the BPTIP.

This 2010 report by the Public Oversight Panel to the Vermont Legislature is written to inform the Legislature of the results of our analysis and review of the recently completed NSA report as well as to respond to the January 15 letter from the Legislative leadership. The NSA report evaluated Vermont Yankee's Advanced Off Gas system and its Buried Pipe and Tank Inspection Program. In order to address the three specific areas mandated by the Legislative leadership, our report also covers topics outside of NSA's AOG and BPTIP evaluation.

2. VERMONT YANKEE PERFORMANCE SINCE THE MARCH 2009 PUBLIC OVERSIGHT PANEL REPORT

Vermont Yankee completed a refueling outage in November 2008. VY then operated continuously for 531 days until the April 2010 refueling outage, with some reductions in power output for various reasons. Operating 531 days without shutting down was a considerable reliability achievement. This achievement was overshadowed, however, by the fact that undetected underground pipe failures caused tritiated water and other radionuclides to leak into the environment for an extended period.

The Panel's March 2009 report noted a VY trend under Entergy ownership of significant capacity factor achievement combined with several major problems. Specifically, the Panel stated,

> Despite VY's reliable past performance, the plant has experienced significant operational shortcomings in the recent past. In June 2004, an electrical problem in the portion of the plant that carries electricity out of the plant resulted in a significant fire in the plant's main transformer located just outside the turbine building. In August 2007, part of the cooling tower collapsed. The structural members of the cooling tower were repaired. Yet subsequent to the repair, in 2008, another failure occurred followed by an additional occasion of cooling tower leakage. Individually, these events were not of much reliability significance. Their importance in indicating potential areas of concern is discussed in Section 4.5.2 of this report. (Public Oversight Panel Report, 3-19-09 p. 7)

Events that have occurred at Vermont Yankee following the Panel's 2009 report indicate that this disturbing trend continues.

3. THE LEAKAGE OF TRITIATED WATER

Based upon information provided by Entergy and analyzed by NSA, the Panel believes that the January 2010 leakage of tritiated water was caused by a series of interconnected events:

- To assure reliability, the inlet portion of the AOG system consists of two redundant trains of pipes and components. Half of the inlet portion of the AOG system is therefore always available and sufficient for full power operation.
- At some point in time the steam traps in each AOG inlet train became degraded. These two degradations then caused two separate pipes (one in each train) to begin to leak tritiated water.[6]
- The leaking tritiated water collected in the underground tunnel in which the pipes were housed for an extended period of time because the drain line from the tunnel was plugged with debris.
- This clogged drain line led to a sump in the AOG drain pit with a sump pump that was not monitored by ENVY personnel.

6 A video animation of Entergy's summary of the leak sequence can be viewed at http://www.safecleanreliable.com/tritium/.

- As the tritiated water rose in the tunnel, it leaked through a pipe penetration of the tunnel wall into the soil.
- The tritiated water leaking into the ground also contained cesium 137, cobalt 60 and strontium 90 among other radioactive isotopes.
- By July 2008, the soil near the leak was so saturated that it began to exhibit non-uniform subsidence.
- By January 2010, the tritiated water from the leak had migrated through the soil and reached a monitoring well several hundred feet away.

4. RESPONSE TO LEGISLATIVE QUESTIONS

4.1 REEXAMINATION OF THE MARCH 2009 REPORT

As stated previously, the Panel's March 2009 Report to the Legislature contained an incorrect statement. The Panel was misinformed regarding the existence of underground pipes carrying radionuclides at VY. Both the DPS and NSA agree that the 2008 NSA report and the 2009 Panel report were incorrect on this point. NSA was therefore chartered to evaluate the AOG system and the BPTIP program in order to provide the Legislature with the assessment of an underground piping system carrying radionuclides as required by Act 189. The Panel was frequently briefed on the progress of the reconstituted assessment and provided input to NSA as appropriate.

The Panel met approximately monthly from January through May. We received two briefings from Entergy during this time. Once again we received valuable assistance from the Department of Public Service and from Assistant Attorney General Rebecca Ellis.

4.2 METHODOLOGY

The methodology NSA applied in its evaluation of the AOG system and the BPTIP program was quite similar to the methodology NSA applied in its December 2008 report. However, NSA expended considerably more person hours on this one effort in 2010 than in its evaluation of any single system in the 2008 assessment and report. The Panel viewed the additional NSA effort as appropriate given the observed leakage coupled with the inaccurate statements about the existence of underground piping carrying radioactivity.

4.3 NSA CONCLUSIONS

The Supplemental NSA report is extensive and contains further comments and suggestions for improvements at VY. In most respects these confirm the recommendations of the original CRA. The Panel assumes that these comments and suggestions will be included in individual Corrective Action (CR) items that will be tracked for progress via ENVY's tracking system. These new CR items would be in addition to the 81-corrective action items that were identified for the 2008 NSA Report and the 2009 Panel report. Rather than address each of these issues individually, the Panel focuses upon two broad management concerns identified by NSA.

4.3.1 PANEL CONCERN #1- RESOURCE ALLOCATION

In its 2010 Report, NSA identified and discussed low level repetitive equipment issues:

> Low level repetitive equipment issues on non-safety related systems are not resolved in a timely manner and could challenge future plant reliability. There is a need for more management focus and timely resolution of repetitive low-level equipment issues on non-safety related structures, systems, and components. This was identified in the original CRA as an issue with the Cooling Towers, and it has recently been self-identified during an ENVY Quality Assurance Audit in March 2009 as an area for improvement: 'Weaknesses in implementation of some corrective actions have led to untimely or ineffective issue resolution.' It was evident again, during this supplemental assessment of the AOG system, that long-standing repetitive issues with AOG components such as: hydrogen analyzers; valve seat issues with AOV-OG-101A; AOG drain tank level control issues; and, steam trap MS-107-1A repairs challenged Operations and could have impacted station reliability. (NSA 2010 Supplemental Report, page ii)

NSA has determined one common cause of these longstanding AOG problems to be a lack of adequate resources being applied to solve each issue definitively. The Panel agrees with NSA that ENVY has not applied enough resources to assure that the AOG system continues to function reliably in the future.

In its 2009 report, the Panel noted that inadequacy of available resources for non-safety related systems probably contributed to the cooling tower collapse in 2007 and leakage in 2008. The Panel is concerned that, one year later, inadequate application of resources continues to plague some non-safety systems, this time the AOG system. In its 2009 report, the Panel said,

> Management issues – ENVY management needs to do a more effective job of leading VY in improvement changes and in effectively applying procedures and processes. ENVY management attention and leadership for the changes

> recommended by the Report are extremely important as the ENVY workforce changes with retirement and replacements of long term employees. ENVY management needs to assure adequate resources are allocated to the reliability of nonsafety-related systems. (Oversight Panel Report for the Vermont Yankee Reliability Assessment, March 2009, page iii)

Other outside observers have also identified resource allocation problems within Entergy. Writing about the Indian Point nuclear plants in New York, Entergy's own team of experts said,

> The physical condition of the plant in non-safety areas is visibly deficient. While station personnel pay close attention to the care, maintenance and operation of plant safety systems, the care and maintenance of some other plant systems and structures do not meet the standards of high-performing plants…. While these have no direct bearing on safe operation of the plant, it is the Panel's view that the maintenance and preservation of non-critical plant systems, equipment and structures is important, because it communicates to employees and the public alike the owner's and operators' commitment and professionalism. (Indian Point Independent Safety Evaluation Report July 31, 2008, page 11)

Limited resource allocation for non-safety systems might, therefore, be systemic within Entergy.

The issue of inadequate application of resources takes on heightened importance given Entergy's status as an aging plant. Over the remainder of Entergy's operating life, the possibility of shutdown within a few years can never be ruled out and will become a near certainty at some point.

If the events of the last few years are any guide, Entergy has a tendency to focus expenditure on safety systems and systems of obvious reliability importance while withholding resources from systems that it deems of secondary reliability importance. While these policies have not yet carried a significant reliability penalty at Vermont Yankee, they have undermined the plant's standing in Vermont in ways that will impact hiring of new personnel, relations with state government and possibly even affect the life of the plant.

4.3.2 **PANEL CONCERN #2- INADEQUATE QUESTIONING ATTITUDE**

In its 2010 Report, NSA said,

> Underground and non-readily accessible piping leaks must be more proactively monitored, detected and managed. Over the past few years, five pipe leak events have occurred on AOG drain lines at ENVY. While none of these were "buried

> pipes," [*footnote omitted*] they were either in underground piping that is not buried or in non-readily accessible pipes. A few of these required significant investigation and repair activities. The SR (Supplemental Report) Assessment Team concluded that ENVY does not have an effective program or practices in place for early leak detection and monitoring of underground and non-readily accessible piping. The extent of conditions from the current AOG leak event is unknown and will not be fully understood until after the completion of the Root Cause Analysis [*footnote omitted*]. Therefore, underground and other non-readily accessible piping could be a challenge to future plant reliability if they are not proactively monitored, detected, and managed. (NSA 2010 Supplemental Report, pp. ii and iii)

Jay Thayer, ENVY's former site vice president, identified the importance of a "questioning attitude" for an effective nuclear power plant staff in 2003 testimony before the Public Service Board.

> Our engineers and our inspectors continue to look for discrepancies. They continue to make sure that the documentation matches what's out there in the field, and we continue to have what we call this questioning attitude. Don't assume, always question. If you are starting design work, question the assumptions. Go back and have a questioning attitude about the information, and that's how on occasion some of these minor low safety significant discrepancies are turned over because our people have the kind of questioning attitude that will result in identifying these discrepancies. (Hearing Transcript, Vermont Public Service Board Docket #6812 September 15, 2003, page 149, lines 5-25)

NSA found repeated opportunities when ENVY's staff could have prevented the leak or minimized its impact. These missed opportunities indicate a significant management weakness. Specifically, ENVY management has not evidenced the appropriate support of its staff's "questioning attitude" by providing sufficient resources to correct identified issues.

Three specific events exemplify the Panel's concern regarding missed opportunities.

1. Beginning in July 2008, there were five documented occasions where ground subsidence was noted in the vicinity of the AOG leak. ENVY did not adequately examine any of this ground subsidence, and as a result missed opportunities to identify the leak.
2. Several previous steam trap failures that were precursors to the AOG failures leading to the leak were identified by VY staff but were not acted upon by VY management.
3. The leaking AOG pipes might have been detected much earlier were it not for the

clogged drain in the tunnel in which the pipes were housed. ENVY failed to monitor this drain line and sump pump to see how frequently the pump turned on. Had this drain line operated correctly, there would have been no leak of radioactive isotopes and tritiated water to the environment.

As noted, the April 2010 NSA Supplemental Report suggested that "underground and other non-readily accessible piping could be a challenge to future plant reliability". In May 2010 as Vermont Yankee was returning to power from its planned refueling outage, a new, previously undetected leak occurred in the AOG system. The Panel notes the prescience of the NSA observation and finds this second May leak to be particularly disturbing, as it occurred in the same general area and in the same plant system as the previous leaks. This system and this location in the plant should have been highly scrutinized by ENVY.

This May leak was detected by ENVY personnel on the second attempt to start up VY after refueling. It is thought to have existed undetected on the first attempt as well. That this second leak was not detected during the broader plant investigation is very troubling. Failure analysis in the nuclear industry routinely evaluates the overall magnitude of a problem, and is called the "extent of condition." The May AOG leak shows an inadequacy in the "extent of condition" analysis performed by ENVY on the AOG system and an insufficiently questioning attitude.

5. MISLEADING INFORMATION

The Panel was asked in the legislative letter of January 15, 2010 to "examine the root cause of the misleading information provided to the Public Oversight Panel and the Legislature, look at whether other information may also be incorrect and present your findings to the Legislature…."

After this request was made, the Attorney General's office undertook a criminal and a civil investigation that includes the information presented in the course of the 2008-9-reliability assessment as well as other events. In order not to conflict with that investigation, the Panel has not conducted an investigation of its own. A definitive chronology of the causes of the several

incorrect statements made to various agencies of the State of Vermont will have to await completion of the Attorney General's investigations.

We have reviewed our own records. The NSA consultants who performed the original CRA have provided their recollection of the manner in which they came to understand that no underground piping carrying radionuclides existed at Vermont Yankee in 2008-9.

We consider the incorrect statements in three categories:

1. those made in defining the scope of the assessment (August – December 2008);
2. failures to correct the misstatements at times when Entergy may have been obligated to do so (January – March, 2009);
3. actual incorrect testimony by Entergy in Public Service Board proceedings and incorrect statements in response to inquiries from Mr. Gundersen in his capacity as a consultant to the Joint Fiscal Office of the Vermont Legislature (March – December, 2009). This third category appears to be the most serious. However, these incorrect statements occurred after the completion of the NSA assessment and our original report and therefore did not influence them. Their significance in terms of ENVY reliability can only be determined after completion of the Attorney General's investigation, when it will be possible to assess the adequacy of Entergy's response to the misstatements.

On the information presently available to us, we conclude that the first category (leading to NSA and Public Oversight Panel conclusions to the effect that no underground piping carrying radionuclides existed at Vermont Yankee) does not appear to have resulted from any deliberate effort to mislead on Entergy's part. Several factors contributed to the inaccurate statements in both reports, statements that are reflected in internal Panel documents as early as September 2008 and NSA documents a month earlier. These factors include:

1) The Comprehensive Reliability Assessment focus on systems that might affect reliability. Because none of the buried piping systems that might have contained radioactivity were thought to have reliability significance, the 2008 decision to assess the service water system (which does not contain radionuclides but which is

significant for reliability) was thought to be a better outcome in terms of the purposes of Act 189.

2) At the time these discussions were taking place, Entergy had nothing to gain by deflecting the assessment from underground systems carrying radionuclides. There is no reason to think that the NSA conclusions or the Panel conclusions as to reliability would have been different if the AOG system had been reviewed in 2008, more than a year before the leaks were detected.
3) Some nuclear industry personnel have a specialized definition of the term "buried piping", that is different from ordinary English usage, in which "buried" would be more or less synonymous with "underground". In that specialized definition, "buried piping" only applies to piping in direct contact with soil, not to underground piping in tunnels or encased in protective material. When ENVY technical people were talking with NSA technical people, they apparently lapsed into using the term "buried piping" as they understood it, rather than the term "underground piping" used in Act 189. Whether the pipes are called "buried" or "underground", the statement that they do not exist at VY was always incorrect. Both underground and buried piping contain radionuclides at Vermont Yankee.[7]

On the evidence available to us, the Panel views the misunderstandings and misstatements that occurred during the defining of the scope of the Comprehensive Reliability Assessment (CRA) to have no significant implications for Vermont Yankee reliability.

The second category of events, those encompassing Entergy's review of the Comprehensive Reliability Assessment (CRA) as well as the Company's response to data requests based on the CRA are more problematic, since the forums involved were no longer discussions among technical professionals but included statements intended for various public forums speaking something closer to ordinary English. According to the law firm hired by Entergy to look into

7 Entergy also maintains that its staff considered the phrase "underground piping that carries radionuclides" to mean only "liquid radionuclides". However, the buried drain line would have been carrying liquid radionuclides but for the blocked drain, of which VY personnel were unaware in 2008.

this matter,[8] many Entergy personnel were focused on a "big picture" in which – because they liked the conclusions of the NSA report - they were not predisposed to challenge "minor" inaccuracies that were not derogatory to Entergy.

Entergy may not have had an affirmative duty to correct the misstatement as it appeared in the Comprehensive Reliability Assessment (CRA) or in the Report of this Panel, but the company's allowing the incorrect statement to migrate into its own data responses and testimony is beyond our understanding at this time.

Of still greater concern are incorrect statements made under oath by ENVY personnel in testimony in PSB proceedings (and not promptly corrected). In addition, inaccurate statements were made in response to focused inquiries by Mr. Gundersen in his capacity as a consultant to the Joint Fiscal Office of the Vermont Legislature. In particular, the MLB report concludes that one of the reasons that a clearly inaccurate response was made to Mr. Gundersen was in part "that Gundersen would seek to reopen issues from the Audit".[9] But, of course, if the Comprehensive Reliability Assessment (CRA) contained inaccurate information, reopening it for correction was the proper remedy.

Had this been done in August 2009, before the leaks were discovered, Vermont Yankee's reputation would hardly have suffered. Most, if not all of the Entergy employees who have been removed from Vermont Yankee would still be employed there. Several million dollars spent responding to the inaccurate statement issue would have been available for other uses.

As we noted in our March 2009 report, reliability has several meanings. One of the most important for any long-term relationship encompasses trustworthiness. All regulatory processes

8 In January 2010, Entergy retained the firm of Morgan, Lewis and Bockius (MLB) to interview its employees regarding the chain of inaccuracies discussed in the report. The MLB report, made available in late March 2010, concludes, "the Investigator did not find that any ENVY personnel or representative intentionally misled third parties about the existence of underground piping at VY that carries radionuclides. Although the Investigator did not find a basis to substantiate intentional wrongdoing… the Investigator found that certain ENVY personnel failed at times to clarify understandings and assumptions and therefore allowed statements to be made that were incomplete or inaccurate when viewed in a context different from the one relevant to the CRA".

9 Morgan, Lewis and Bockius report, *supra,* note 8, p. 112.

depend in large part on the accuracy of the information provided by the participants, especially the regulated entities who invariably possess and control most of the information. The integrity of the information is the lifeblood of capable regulation and of public confidence in regulatory decisions. A regulated entity that does not understand this responsibility and discharge it forthrightly is on a road to reliability problems of more than one sort.

To date, 11 Vermont Yankee employees have been disciplined as a result of this matter. Others may be implicated in the future. These 11 employees were scattered throughout Vermont Yankees organization and not located within one single group or department. A single organizational failure is more understandable than the organization-wide breakdown that occurred at VY.

This organization-wide breakdown appears to indicate that the cultural norms that allowed personnel to perpetuate misstatements for 12-months are endemic throughout the Vermont Yankee organization. The systemic nature of the failures to communicate accurately in important forums and the sheer number of persons involved amplifies the Panel's earlier concern that there is a lack of a questioning attitude within ENVY's organization and corporate structure.

6. POSSIBILITY OF OTHER INCORRECT INFORMATION

In reviewing the extent to which the erroneous information concerning underground piping containing radionuclides may cast doubt on other aspects of the CRA or our own report, we have been guided by several considerations:

1) As noted earlier, the original error concerning the presence of underground piping does not appear to have resulted from a deliberate effort on Entergy's part to mislead NSA or the Panel. We have not found other erroneous statements in our 2009 report. Nothing we have reviewed causes us to believe that other information from Entergy contains false statements.
2) NSA has stated that it believes the underground piping carrying radioactivity issue is the only incorrect information disseminated by ENVY contained within

the CRA. NSA has performed several surveys of additional data to confirm its accuracy. The Panel has no reason to doubt NSA's conclusion that the underground pipe issue is the only area where incorrect information was provided to the CRA.

3) Even though the CRA involved a substantial human resource investment, it could only verify a relatively small portion of the total information available as to conditions at Vermont Yankee. The Panel had no separate verification capability beyond its own expertise. Consequently, our report and the CRA itself depend heavily on Entergy's information for their own accuracy.

7. PUBLIC OVERSIGHT PANEL CONCLUSIONS

The Panel's March 2009 conclusion as to overall reliability of Vermont Yankee read in part,

> Acceptable reliability of VY for operation beyond 2012 is possible if the recommendations of this report and the NSA Report are taken. Specifically, there must be a credible and public verification put in place to assure the recommendations are implemented satisfactorily and in a timely manner. This verification should be accomplished through strengthened government institutions that should be characterized by high professional competence commensurate with the tasks at hand, domination neither by specific proponents nor by specific opponents of nuclear power, resources adequate to effective performance at ENVY's expense, periodic effective reports of verification, with reports available to the public, and the ability for public interaction and recourse through structured, credible and established institutions. (Oversight Panel Report for the Vermont Yankee Reliability Assessment, March 2009, p. v)

The events covered in this supplement do not cause us to change this fundamental conclusion, but they do introduce new notes of caution in the areas on which this supplement focuses.

The communication from ENVY to state officials simply must be on a clearer and more forthcoming basis than was evidenced with regard to the underground piping issue in much of 2009. The ink had hardly dried on the principles of credible and competent verification and public interaction that we endorsed in March 2009 before they were apparently significantly undermined by Entergy's handling of the underground piping question.

No report written today can state conclusively that Vermont Yankee will or will not be operated reliably for an additional 20 years. As noted earlier, the Panel acknowledges that Vermont Yankee recently completed 531 days of uninterrupted operation, which in itself is a significant achievement.

However the Panel also recognizes several key management concerns that have not been rectified or addressed. Moreover, it appears that some of these broad concerns may in fact be as persistent in 2010 as in 2009. Entergy cannot operate VY reliably for an additional 20 years unless it successfully reestablishes a corporate culture where its individual employees and the organization as a whole have a questioning attitude, and where adequate resources are consistently spent on non-safety systems.

Appendix A – Letter Reactivating the Public Oversight Panel

January 15, 2010

Dear Peter Bradford and Arnie Gundersen,

You both were notified yesterday by the Department of Public Service that the tritium found several weeks ago in a monitoring well on the Vermont Yankee site may also be present in many unreported radioactive underground pipes. While the actual source of the leak has yet to be discovered, it now seems clear that either a buried pipe or tank containing radioactive material is leaking. In your role as members of the Vermont Yankee Public Oversight Panel, you were informed in 2008 by several Entergy sources that there were no such pipes on the Vermont Yankee site. That misrepresentation calls all of the Panel's conclusions into question.

We are reconstituting the Vermont Yankee Public Oversight Panel to reexamine the conclusions of their March 2009 Report due to the fact that we can no longer guarantee the accuracy of information provided to the Legislature.

The Legislature has been tasked with evaluating the reliability of Entergy's Vermont Yankee Nuclear Plant. As legislators, we cannot make a correct assessment if we have the wrong information. We request that you examine the root cause of the misleading information provided to the Public Oversight Panel and the Legislature, look at whether other information may also be incorrect and present your findings to the Legislature no later then February 16, 2010. We also request that the Public Oversight Panel be actively involved in discussions with the Department of Public Service, Nuclear Safety Associates and Vermont Yankee including requesting your own interviews and personal analysis of reports and drawings as you see appropriate.

Your active involvement in this process is appreciated. Thank you for your work.

Sincerely,

Senate President Pro Tem Peter Shumlin

Speaker Shap Smith

Appendix B – Panel Resumes

Peter A. Bradford
Peter Bradford is an adjunct professor at Vermont Law School, where he teaches Nuclear Power and Public Policy. He was a Commissioner on the U.S. Nuclear Regulatory Commission (1977-82) and chair of the New York State Public Service Commission (1987-95) and the Maine Public Utilities Commission (1982-1987). He has participated in a National Academy of Sciences Panel on alternatives to the Indian Point nuclear power plants in New York, the 2007 Keystone Center fact finding project with regard to U.S. nuclear power, a 1998 European Bank for Reconstruction and Development review of ways to replace the Chernobyl nuclear station in Ukraine, a 1999 walkdown of the Mochovce nuclear power plant in Slovakia, and a 1993 U.S. Office of Technology Assessment study on aging nuclear power plants.

Arnold Gundersen
Arnie Gundersen is the Chief Engineer for Fairewinds Associates, Inc, a Burlington, Vermont paralegal services and expert witness firm. A former nuclear industry senior vice-president and whistleblower, Mr. Gundersen also is a math professor at the Community College of Vermont. Mr. Gundersen testified to the NRC ACRS in June 2010 regarding a significant safety flaw in the design of the new generation reactor the AP1000. During the past year he has proffered expert testimony regarding the Fermi 3, Susquehanna, North Anna, Bellefonte, Beaver Valley, Levy County, Turkey Point 6 & 7, and Callaway nuclear power plants, in addition to a presentation delineating the actual concentration of radioactive isotopes released in Pennsylvania by the Three Mile Island nuclear accident.

Mr. Gundersen earned his Bachelor's and Master's Degrees in Nuclear Engineering cum laude from Rensselaer and was a licensed reactor operator. As a Senior Vice President, Mr. Gundersen's business responsibilities encompassed about 400 technical and engineering employees at nuclear plants throughout the country. He was responsible for projects at 70 nuclear plants, including providing nuclear fuel racks for Vermont Yankee in the 1980's. He holds one patent for an "Energy Absorbing Turbine Missile Shield" for nuclear power plants. As an independent nuclear engineer and expert witness, Mr. Gundersen reviewed more than 200,000 pages regarding Vermont Yankee's uprate application, decommissioning fund, and life extension. In testimony to the VT PSB, he predicted the VY cooling tower collapse, as well as predicting aging management issues, inspection problems similar to those that led to the VY transformer fire, and the shortfall in the Decommissioning Fund. As an expert witness, he is frequently called upon to testify to the NRC, Congressional and State Officials on nuclear power operations and has also testified to the Czech Republic's Senate. He was an expert witness in the cases involving Three Mile Island, Western Atlas, Peach Bottom, and Florida Power and Light. Mr. Gundersen was a co-author of the initial DOE Decommissioning Handbook (1982), co-author of the Fairewinds Associates white papers on the ENVY Decommissioning Shortfall (2006), and is presently researching a scientific paper regarding Strontium 90 releases from early Boiling Water Reactors.

C. Frederick (Fred) Sears
Dr. C. Frederick Sears is a nuclear safety and management consultant with over 47 years of experience in the nuclear industry. He recently retired from The Pennsylvania State University

where he served as Director of their Radiation Science and Engineering Center. Prior to working at Penn State Dr. Sears had retired as a Vice-President at Northeast Utilities (NU) where he had been responsible for corporate environmental activities. Prior to that he had been the NU VP responsible for Nuclear Engineering including safety and nuclear analysis, PRA, QA/QC, nuclear training, generation facilities licensing, nuclear services support (including radiological protection, emergency preparedness, chemistry support, materials management, and event analysis), nuclear fuel supply, safety review committees, and environmental services. He served as the corporate nuclear emergency director and spokesperson. He was also responsible for the management of the annual corporate generation facility (nuclear and fossil) budgets. Prior to working at NU he was employed by Combustion Engineering (CE) in roles ranging from Chief Test Engineer for startup and testing of CE supplied NSSSs, to Assistant Project Manager to Manager, Product Development. He also served on active duty in the U.S.Army Reactor Group where he was the Assistant Chief, Nuclear Branch responsible for reload design, safety analysis and testing of Army nuclear power plants; during this service he qualified as Officer-in-Charge (equivalent of station director). In addition to his Army reactor qualification he has held four NRC/AEC reactor or senior reactor licenses.

Sears has served on numerous nuclear industry committees including: DOE's Advisory Committee on Nuclear Facility Safety; Wisconsin Energy Board's Nuclear Oversight Committee; National Academy of Science's Bilateral Exchange with USSR on Reactor Safety; Industry Degraded Core Committee (IDCOR) – Vice Chair; Industry committees on Chernobyl and TMI; and Executive Committees for GE Boiling Water Reactors Owners Group; Test, Research & Training Reactor Group; American Nuclear Society-Nuclear Installation Safety Division - Chair; EPRI Advanced Light Water Reactors – Chair; and Industry Radioactive Waste Management Committee (EEI-UWASTE) – Chair. He has also worked with the companies managing the DOE complexes at Hanford and Savannah River regarding design basis reconstruction and reactor operations.

Sears holds bachelors and masters degrees in physics and nuclear science & engineering from the Virginia Polytechnic Institute and State University and a doctorate in nuclear engineering from the Pennsylvania State University. He also has completed the Executive Management Program of the Edison Electric Institute and the Advanced Management Program of the Harvard School of Business.