RAS-1609

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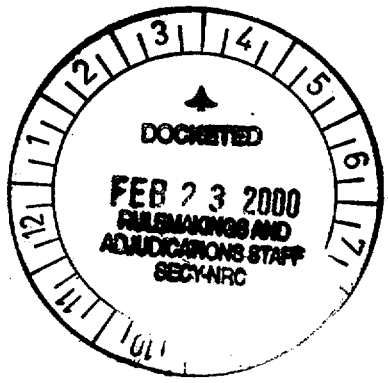
CITIZENS AWARENESS NETWORK

February 22, 2000



Office of the Secretary
Rulemaking and Adjudications Staff
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

RE: Citizens Awareness Network's Request For Hearing And Petition To Intervene In The License Transfer For Vermont Yankee Nuclear Power Station, Request For Stay Of Proceeding, And Request For Subpart G Hearing Due To Special Circumstances, *Vermont Yankee Nuclear Corporation* (Vermont Yankee Nuclear Power Station--*License Transfer*) Docket no. 50-271-LT

Dear Mr. Secretary:

Enclosed please find, for filing and service upon the Commission and Secretary, the original with attachments and five copies of the above referenced documents.

Thank you for your kind assistance.

Very Truly Yours,

Frederick. Katz,
President, CAN

Enc./as described above

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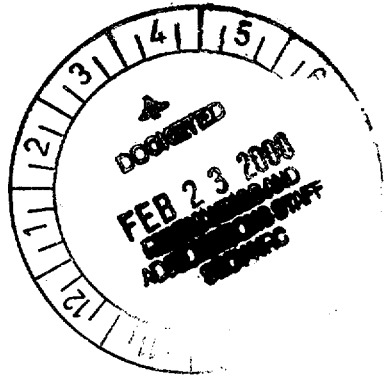
SECY-02



Before the
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of Vermont Yankee Nuclear Power Corp. Application for transfer of Part 50 license for Vermont Yankee Nuclear Power Station to AmerGen Vermont, LLC	Docket No. 50-271

CITIZENS AWARENESS NETWORK'S REQUEST FOR HEARING AND PETITION TO INTERVENE IN THE LICENSE TRANSFER FOR VERMONT YANKEE NUCLEAR POWER STATION, REQUEST FOR STAY OF PROCEEDING, AND REQUEST FOR SUBPART G HEARING DUE TO SPECIAL CIRCUMSTANCES

Citizens Awareness Network, Inc. [CAN], pursuant to 10 CFR §§ 2.1306, 2.1308, and, see below, § 2.1329(b), hereby requests that the United States Nuclear Regulatory Commission conduct a hearing on the pending application to transfer the operating license for the Vermont Yankee Nuclear Power Station ["Vermont Yankee" or "VYNPS"] from the Vermont Yankee Nuclear Corporation ["Vermont Yankee"] to AmerGen of Vermont, LLC ["AmerGen"], and petitions to intervene in such hearing. In support of these requests, CAN has provided the attached declarations of a representative member of CAN, Anne Britton, Exhibit 1, attached hereto, and expert opinions in the declaration of David Lochbaum, Union of Concerned Scientists, Exhibit 2 (with attachments 'A' and 'B'), attached hereto, and further sets forth as follows:

Motion to Stay Proceeding and/or Decision on Application for License Transfer

CAN requests that the Commission stay the instant proceeding (and/or decision) until there is a decision of the Vermont Public Service Board approving or disapproving the applications of Vermont Yankee Nuclear Power Corporation, Green Mountain Power Corporation, Central Vermont Public Service Corporation for a certificate of public good and a

determination that the transaction is prudent, used and useful. Vermont Yankee Petition ¶7; Green Mountain Power Corporation Petition, ¶¶ 3,4,5,6; CVPS Petition. In the alternative, the Commission should at least stay the proceeding until there is a decision on pending motion to dismiss.

Motions pending before the Public Service Board contend that the Board lacks jurisdiction to make a determination in this proceeding that the transaction is prudent, used and useful. New England Coalition on Nuclear Pollution's [NECNP's] Motion to Dismiss Petitions and Requests for Rulings That AmerGen Sale Is Prudent, Used and Useful (January 14, 2000), NECNP's Supplement to Motion to Dismiss (February 22, 2000); CAN's Motion to Dismiss (February ,2000), and CAN's Supplement to Motion to Dismiss (February 22, 2000). The Board held a hearing on these motions on February 10, 2000, reserving decision and allowing supplemental motion practice until February 22.

Significantly, if the Board decides that the issue of the prudence, used and useful character of the sale transactions is outside its jurisdiction at this time, it is very likely that the sale will not take place. *See, e.g*, Green Mountain Power Corporation Petition at ¶¶3, 4, 5, 6; *see also* Prefiled Testimony of William J. Deehan and James C. Cater at 18-21 (December 1, 1999).[1] For this reason, CAN contends that the Commission should suspend the consideration of AmerGen's

[1] CAN has not provided copies of the cited filings as it contends that AmerGen should have provided such material to the Commission, in order to meet its duty to keep the Commission appraised of the status of the Vermont Public Service Board proceeding so to avoid wasting the scarce resources of the Commission, parties, and would-be intervenors on opening a proceeding that may soon be moot. *See, e.g., Niagara Mohawk Power Corporation, New York State Electric & Gas Corporation, and AmerGen Energy Company, LLC* (Nine Mile Point, Units 1 & 2), CLI-99-30, 199 NRC LEXIS 115 at *13-14 (December 22, 1999) (Commission believes that it wold not be sensible to require the expenditure of both public and private funds on a proceeding, part or all of which may well be rendered moot in the immediate future).

application at least until the Board has decided the motion, if not until the Board reaches a dispositive conclusion on the issue.

CAN also contends that the proceeding should be suspended until the outcome of the Vermont Public Service Board proceeding because it will be unduly burdensome on CAN, a small membership organization lacking the resources of the utilities involved in this matter, to participate in multiple forums. At this time, AmerGen has also opened a related FERC approval proceeding to which CAN has a timely, pending application for intervenor status. Thus, already participating in the Vermont Public Service Board proceeding and the FERC proceeding, CAN's burden is significantly greater than that placed upon other parties who are "regularly participants in proceedings concurrently conducted by other state and federal agencies" and possess legal and financial resources far beyond those of ordinary citizens and environmental organizations such as CAN. *Niagara Mohawk, supra*, at 14-17. Additionally, if the Vermont Public Service Board rules that the sale is not approved, any and all parties to the instant proceeding will have wasted time and money on a matter that is moot. Similar considerations apply to awaiting the Public Service Board's ruling on the pending motions to dismiss.

Wherefore, CAN moves that the Commission suspend the proceeding until a final decision from the Vermont Public Service Board on the dispositive matter now before it.

Motion to Hold Subpart G Hearing Due to Special Circumstances

CAN also requests the Commission, pursuant to 10 C.F.R. §2.1329(b), due to the "special circumstances concerning the subject of the hearing" to hold a substantive subpart G hearing, or, in the alternative, a substantive subpart M hearing at the preliminary stage with the possibility of converting to a subpart G hearing if necessary. CAN contends that, due to the issues and justifications set forth herein below, the application of subpart M, particularly in cross

examination and discovery, would not serve the purposes for which the rule was intended--full and fair hearing on license transfer on an expedited basis. CAN contends that upon careful examination of the materials provided herein below and attached hereto, the Commission will have an adequate basis to determine that the matters in this license transfer are not strictly "financial in nature" as contemplated in the promulgation of Subpart M. In this regard, the Commission's ruling in *Niagara Mohawk Power Corporation, New York State Electric & Gas Corporation, and AmerGen Energy Company, LLC* (Nine Mile Point, Units 1 & 2), CLI-99-30, 199 NRC LEXIS 115 at *18-19 (December 22, 1999), is distinguishable from the instant case. In this case, given the issues raised herein below, public and occupational health and safety are at issue, not merely administrative determinations concerning the paper transfer of a the license and conforming of technical specifications to reflect such a mere paper change. CAN contends that the Commission will completely abdicate its responsibility to protect public health and safety of workers and the public and also abdicate, thereby, it duty to safeguard the national interest, under the Atomic Energy Act, §§ 105, 184, 189a, if it permits the license transfer at issue to go forward as a purely "administrative" determination without considering the extensive substantive issues surrounding this particular transaction. Such issues will only receive adequate attention in the context of a full adjudicatory hearing process with the right to call for evidence, present evidence, and cross examine evidence.

In support of the above motions and requests, CAN further sets forth herein below as follows:

I. INTRODUCTION: PRELIMINARY ISSUES AND ARGUMENTS.

The nuclear Industry in the US presently faces a transformation which will radically reorganize the financial and management structure of the nuclear power industry and have a

resultant direct impact upon occupational and public health and safety. Two giant commercial combines, one national and the other a multinational conglomerate, are rapidly purchasing the United States reactor inventory. Beginning with the aging and embrittled fleet of nuclear generating stations in the Northeast, in a piecemeal fashion, region by region. AmerGen has now acquired Three Mile Island and Clinton, has submitted license transfers on Oyster Creek, was bidding on Nine-Mile Points 1 and 2, and intends to bid on the Millstone complex.[2] State regulatory authorities with limited powers are overwhelmed by the task of determining the dubious fiscal propriety of such transactions.

This revolution in ownership of nuclear power capacity originated as a crisis of the competitive market brought about by utility deregulation and proposed deregulation. Initially, this process was intended to end monopoly control of electricity production and sales and reduce costs to consumers through the aegis of market competition. Thus far, nuclear power has required massive public subsidy in order to survive in regulated markets. The public now faces with a potentially massive debt due to the investment in "power too cheap to meter."

This debt burden will be comprised of shortfalls in decommissioning funds and billions of dollars in stranded costs from bad investments in a technology which the nuclear industry did not deliver as promised (i.e., safe and clean "power too cheap to meter").[3] State authorities facing the prospect of being forced to manage the clean up of contaminated reactor sites have been willing to agree to any offer which might relieve the state of financial liability for future site remediation under decommissioning. These agreements include a 12 year, above market rate power contract

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[2] Associated Press, Facts About The Companies (June 25, 1999); see also Dave, Decommissioning Trust Funds Lure Potential Nuclear Plant Buyers 40 NUCLEONICS WEEK at 1 (Mar. 18, 1999). Exhibits 3 and 4, attached hereto.

[3] *Id.*

in Vermont Yankee's case, the purchase of nuclear stations at 10 cents on a dollar in Pennsylvania (Three Mile Island) and New Jersey Oyster Creek), and ratepayer responsibility for the stranded debts of nuclear utilities as in Pennsylvania, Illinois, Massachusetts and Connecticut.[4]

The procedure in this instant case, which the applicant and the NRC have characterized as a simple license transfer application with no health and safety implications, is but part of the rapidly accelerating consolidation of nuclear power ownership. By choosing to abdicate its antitrust authority under the Atomic Energy Act, the NRC permitting a *de facto* revolution, a rapid consolidation in nuclear power ownership through premature acceptance of this and other AmerGen (LLC) applications and the accelerated hearing schedules they seek to impose.[5] The unique and unprecedented events which are now before the Commission and other federal agencies require changes in the regulations governing these emerging entities, and the enforcement practices and scrutiny of the applications which will allow this rapid consolidation to go forward. As such, the Commission has a solid basis for delaying or suspending the instant proceeding to permit the kind of time it takes for the careful scrutiny and deliberation over such applications as is appropriate under the unprecedented nature of the transformation now taking place. To wit, among other considerations, one of AmerGen's parent companies, PECO, has just been acquired by Unicom, parent company of Commonwealth Edison Company. AmerGen acknowledges this mega-merger, asking that the Commission forestall consideration of the implications of such an acquisition until after it has decided the instant matter. G. Rainey,

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[4] *See generally*, Petition of Vermont Yankee Nuclear Power Corporation and Prefiled Testimony, Vermont Department of Public Service, Docket No. 6300 (November 22, 1999); *see also* Herbert, Josef, *Nuclear Plants Sell At Bargain Basement Prices*, JOURNAL OF COMMERCE at 11-A (Mar. 17, 1999). VY petition not attached. Josef article attached hereto as Exhibit 5.

[5] Salpukas, Agis, *A Small Circle of Companies Seeks Control of Reactors*, NEW YORK TIMES, at C-1 (March 6, 1999). Exhibit 6, attached hereto.

AmerGen Vermont, LLC, and R. Barkhurst, Vermont Yankee, Letter to Samuel Collins, NRR at 4, n.1 (January 6, 2000).

Given the very real potential consequences to the human and natural environmental which would flow from approval of this segmented sequence of license transfers leading to an unsupportable aggregation of holdings with management bent on maximizing profit to survive, as detailed in issues herein below, the Commission should regard the request as part of its decisionmaking process concerning a major federal action affecting the quality of the human and natural environment, and deny that request. The Commission should also conduct an Environmental Impact Study, pursuant to the requirements of the National Environmental Policy Act [NEPA], on the potential effects of massive consolidation of nuclear power facility ownership, with particular attention to foreign ownership in that picture. NEPA, 42 U.S.C. §§4321, *et seq.*; AEA, 42 U.S.C. §2133

A thorough understanding of the terms of all agreements and internal projections and plans for reactor operation and financing is necessary for assessing the impacts of this license transfer on health and safety issues. Therefore, the priority (practice) of holding any information regarding finances of potential licensees as proprietary reasonably should be set aside in favor of the imposition of a higher standard for information to achieve proprietary status in order to satisfy the public interest. The financial condition of licensees have always been subject to NRC standards and the NRC has recognized such information as relevant to issues of public health and safety. AmerGen and its parent companies support the withholding of information in order to limit public access to information. CAN contend that this information is relevant and in the public

interest, and that permitting the applicant to withhold it undermines the public's ability to participate in the proceeding.[6]

Any argument AmerGen may make that the issues contained in its petition should not be fully examined in order to expedite approval of the license transfer must be denied lest the NRC abdicate its responsibilities under the Atomic Energy Act.[7]

Transfer of the Vermont Yankee license, in the context of the recent historic effects of deregulation, coupled with AmerGen's intention to acquire an extremely large "fleet" of nuclear reactors, greatly accelerates the on-gong transformation of the entire financial basis of the nuclear power industry in the United State. This alone should be sufficient to trigger heightened NRC scrutiny of these transactions.

AmerGen has applied for license amendments that would transfer the ownership of several nuclear stations, and clearly plans to continue on this course. The NRC has a clear responsibility to take a broader view of the impact of not only amendments to Vermont Yankee's operating license, but the total impact of multiple license transfers to a single holding company during a period which Commissioner Edward McGaffigan characterizes as a "dynamic time for the nuclear industry"[8] and one in which the agency has publicly committed itself to alleviating the regulatory

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[6] Hencke, David, *Nuclear Industry's Plea For Secrecy*, THE GUARDIAN at 7 (July 8, 1999). Exhibit 7, attached hereto.

[7] The Atomic Energy Act of 1954, as amended [AEA], provides in pertinent part that:

> [N]o license granted hereunder * * * shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person, unless the Commission shall, after securing full information, find that the transfer is in accordance with the provisions of this Act, and shall give its consent in writing.

AEA § 184, 42 U.S.C. §2234 (emphasis added); *see also* 10 CFR §§30.34 (b), 40.46, 50.80, 72.50.

[8] Smith, Rebecca, *Power Industry Changing in the Face of Deregulation*, THE WALL STREET JOURNAL (October 28, 1999). Exhibit 8 attached hereto.

burdens on the industry in order to strengthen the competitiveness of nuclear power (a commitment with a dubious relationship to the Commission's statutory charge, post AEC, in contradistinction to that of the Department of Energy).

The ongoing process of deregulation of the electric power industry and resulting changes in the ownership of generating stations has outpaced the NRC's ability (and other agencies) to effectively react and regulate. The vacuum of state and federal regulations guiding this new direction in the industry necessitates that the NRC TAKE special care to consider the unfolding ramifications of permitting a rapid proliferation of license transfers and mergers. Given this ever-mounting costs of decommissioning and the effects of a single, massive failure by one large company holding dozens and dozens of facilities, the financial consequences could easily outstrip the Savings and Loan scandal. Were that not enough to inspire the NRC to exercise greater care, the potential negative implications for the health and safety of workers and the public are disquieting, to say the least. Certainly, one would hope, this is disquieting enough to warn the Commission against continuing the course of hasty approval its has thus far sponsored.

Of even greater serious for the impact on occupational and public health and safety, the transfers and mergers at issue are taking place concurrently with the introduction of the NRC's Revised Reactor Oversight Process and a shift towards so called "risk based" regulations. This comes in response to NRC funding cutbacks. The number of resident inspectors at many of the stations whose licenses may be transferred will be reduced, lessening NRC oversight and direct, on-site support of the new owners, thus permitting an increased risk to occupational and public health and safety. For a new, inexperienced player such as AmerGen to "enter the game" at this point makes an already complicated situation even more complex, and leaves the public increasingly vulnerable to the consequences of nuclear mishaps.

On yet another score, AmerGen's license transfer is untimely. The Internal Revenue Service has yet to rule on the AmerGen's private letter ruling request to relieve it from the tax consequences of acquiring the decommissioning trust funds for Vermont Yankee and the rest of AmerGen's fleet of nuclear generating stations. Although the IRS ruled on AmerGen's and Entergy's earlier private letter ruling submissions, it plainly stated that this decision could not be used as a precedent.[9] Significantly, in both cases, the IRS ruling disallowed transfer of non-qualified funds as tax exempt. Exercise of the IRS's discretion, rather than an interpretation of its regulations, formed the basis of both rulings--hence, such discretion may or may not be exercised in this case. News sources indicate that inability of AmerGen to receive the requested tax relief from the Internal Revenue Service is a "deal-breaker" for completion of nuclear facility sales..[10] This means that an NRC approval of license transfer would be premature prior to the IRS response, as a negative IRS response would moot the NRC's actions.

The AmerGen sales could proceed despite an unfavorable IRS ruling. The amount of capital required to secure these buyouts, however, could easily compromise AmerGen's financial security. This situation thus raises questions about AmerGen's ability to own, operate and decommission Vermont Yankee--in addition to the fleet of nuclear power stations it plans to have and operate.[11] Given that AmerGen wants up to 100 American nuclear generating stations, the

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[9] Internal Revenue Service Letter Rulings 1999 TNT 210-36 *Qualified Nuclear Decommissioning Funds Won't Recognize Gain*, Doc 1999-34921, LTR 199943041 (July 21 1999). Exhibit 9, attached hereto.

[10] Stellfox, David *Decommissioning Fund Tax Treatment Could Break Plants Sales Deals*, NUCLEONICS WEEK, (January 28, 1999); Bishop, Todd, *PECO in Pickle Between A Nuke Buy and Taxes*, 18 PHILADELPHIA BUSINESS JOURNAL at I-25 (July 30, 1999). Exhibits 10, 11 attached hereto.

[11] Airozo, Dave, *Decommissioning Trust Funds Lure Potential Nuclear Plant Buyers* 40 NUCLEONICS WEEK at 1 (March 18, 1999). Exhibit 12, attached hereto.

tax consequences at issue are substantial[12] and must be analyzed, considered, and understood within the context of AmerGen's entire scheme in order for the NRC to make any rational decision on the appropriateness of what AmerGen puts forward as yet another, "isolated" license transfer application.

CAN, thus, requests the NRC to deny or defer AmerGen's application until such time as the issue of tax consequences has been determined and AmerGen's financial responsibilities are clarified. In support of this request, CAN notes, pursuant to subpart M, that the above request to deny or defer the application is supported in part by the same rationale supporting suspension of the proceeding set forth above on motion.

II. ADDITIONAL ISSUES AND STANDING CONSIDERATIONS[13]

1.A The Application For License Transfer Should Be Denied Because The Application Does Not Provide Sufficient Assurance Of Adequate Funding For The Eventual And Actual Costs Of Decommissioning VYNPS .

The present cost estimates for decommissioning Vermont Yankee do not reflect the costs required to meet Nuclear Regulatory Commission regulations for site remediation standards.

Before deregulation, there were agreements between States and electric utilities that ratepayers would pay into the decommissioning trust fund, which, through amortization, would generate adequate funds to assure final site clean-up. AmerGen's Purchase Agreement with VY, and the license amendment application at hand,[14] state that AmerGen will be responsible for adequate funding to clean up the site without the guarantee of continuing ratepayer subsidies or

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[12] British Energy website: www.ukbusinesspark.co.uk.bry44970.htm, at British Energy, UK Activity Report 2000; *see also Changing the Structure: PECO, Brits Create AmerGen, Go Fishing for US Nukes*, ELECTRICITY JOURNAL (November 1997). Exhibit 13, attached hereto.

[13] CAN notes that subpart M of 10 CFR Part 2 refers to "issues" rather than "contentions." Keeping with Commission practice, CAN takes the terms as equivalent.

[14] Filed with VY and AmerGen's above referenced letter to Samuel Collins (January 6,2000).

payments. *See* AmerGen Application and attachments. AmerGen's application does not provide an adequate assurance of its ability to accomplish decommissioning and final site clean-up. In this regard, among other sources, CAN relies on studies of the General Accounting Office (GAO). The GAO found that 36 of 76 nuclear plant licensees had not accumulated sufficient funds as of 1997 to cover future decommissioning costs as estimated under current regulation.[15] GAO expressed concern that evolving competition in the electric industry would exacerbate the problem, and, significantly in this matter, that NRC lacks thresholds for acceptable levels of financial assurances or a mechanism for responding to the risks caused by unacceptable levels of funding. The GAO also concluded that there is no logical, coherent, and predictable oversight of NRC licensees' financial assurance for decommissioning nuclear power facilities.[16] GAO suggests that NRC clarify: (1) the objectives, scope, and methodology of reviews of licensees' financial reports; (2) thresholds for identifying acceptable, questionable, and unacceptable financial assurances; and (3) criteria for actions to be taken based on the results of these reviews.[17] Until recently, it was accepted that there would be large shortfalls in meeting the clean-up costs at nuclear generating stations. Until recently, however, the nuclear industry has always had the option of petitioning for financial relief through increased charges to ratepayers. This options disappears in a "deregulated" market, particularly where stranded costs are apportioned in the restructuring agreement.

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[15] GAO, *Nuclear Regulation: Better Oversight Needed to Ensure Accumulation of Funds To Decommission Nuclear Power Plants* (May 1999).

[16] Foster Electric Report (No. 165), *GAO Report Questions Adequacy of the Funding Mechanisms for Nuclear Plant Decommissioning* at 28 (May 19, 1999). Exhibit 14, attached hereto.

[17] *Id.*.

In this case, AmerGen's averment that it intends to make a profit on decommissioning trust funds and return that profit to its shareholders is, to put it mildly, an exercise in faulty logic, unfounded, and unsupported. For AmerGen to make a profit on decommissioning, it would require that they cut corners and risk the health and safety.

It contradicts industry experience and the historical record.

It also raises the specter of the harms decried in David Lochbaum's Declaration at ¶9 and supported, in part, by in his attached Exhibit 'B' UCS report on Overtime and Staffing Problems in the Commercial Nuclear Power Industry (March 1999). The safety issues, supported by the Lochbaum Declaration, could harm CAN's representative member, Anne Britton. Not only could she suffer property damage due to increased electrical rates, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release. If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve

such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

1.B The NRC must conduct an EIS to determine the level of contamination on and off the VYNPS site to fully determine the level of contamination at VYNPS, and, in turn, to establish the appropriate level of funding necessary for AmerGen to meet NRC site release criteria.[18]

The General Accounting Office report found that before 1980, the NRC permitted licensee to bury radioactive waste at reactor (and other) sites. There was very limited documentation of such disposal, and few, if any, safeguards. GAO examined sites which were contaminated in excess of NRC guidelines. At these site, it found lack of adequate information on buried waste, and groundwater contamination.[19] Additionally, the license renewal inspection program (*see* Declaration of David Lochbaum, Exhibit 2, attached hereto) documented the fact that underground piping to the radioactive waste systems at all nuclear stations have never been properly monitored during the operating life of the reactors. For example, in 1996 Oyster Creek inadvertently released 133 thousand gallons of radioactive waste though a leak in such a piping system. In the 1976, Vermont Yankee dumped 83,000 gallons of primary coolant water into the Connecticut River for which it paid the state of Vermont $30,000.[20] The licensees have not monitored such waste problems--nor did the NRC require them to do so. This is necessary, as pointed out in the observation underlying Mr. Lochbaum expert opinions, *see* Declaration of David Lochbaum, Exhibit 2, attached hereto, in order to ascertain the extent of contamination at

[18] Finding that a license transfer may provide adequate protection of public health and safety under 42 U.S.C. §2232 does not preclude the need for further consideration under NEPA, 42 U.S.C. §§ 4321, *et seq. Limerick Ecology Action v. U.S. NRC*, 869 F2d 719 (3d Cir. 1989).

[19] GAO *NRC's Decommissioning Procedures and Criteria Need to Be Strengthened* GAO/RCED-89-119 (May 1989). Exhibit 15, attached hereto.

[20] Costa, Yvette, *Nuclear Power Plants Worldwide*, Gale Research, Inc. at 407 (1992).

VYNPS (and other reactors), and set realistic funding requirements to meet final site remediation costs due to the nature, location, and extent of such contamination.

Decommissioning, at present, is experimental. The experience of workers and manager at nuclear reactor site has proven to be contrary to expectation at every nuclear station which has begun the decommissioning process. The NRC Staff has acknowledged has acknowledged as much, and is quoted in an article as stating that:

> [T]he Oyster Creek decommissioning process has national significance. Taking apart aging nuclear power plants will cost $15 billion during the next 10 years, according to industry estimates, and little planning has been done. 'We have gotten into this business a lot faster than we expected,' said Jack Roe, director of the NRC's reactor program management. [N]RC workers say they were surprised when nuclear plant operators suddenly announced they would not restart reactors because the reactors were no longer profitable.[21]

To date, at many reactors, given the level of subsurface and groundwater contamination that have been found, levels of contamination and the funding required for cleanup have far exceeded expectations. For example, at the Yankee Nuclear Power Station in Rowe, Massachusetts, one of the smallest commercial nuclear generating stations, decommissioning was initially estimated at $250 million for site clean-up to a "green field" condition. At present, cost estimates are $360 million for "decommissioning" alone, with extras, such as $40 million in site remediation and another $70 million to create the temporary storage for Rowe's 40 million curies of irradiated fuel, bringing the total cost to nearly $500 million. That means, without even having an approved License Termination Plan in place, the cost of cleaning up the tiny Rowe reactor is has already reached nearly 1/2 a billion dollars!

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[21] Moore, Kirk, *Radioactive Rods Could Pose Risk at Oyster Creek* , THE ASBURY PARK PRESS (November 5, 1998). Exhibit 16, attached hereto.

Despite the fact that costs have exceeded estimates in every decommissioning to date, AmerGen claims that, with experience, the costs of decommissioning will decrease, as techniques are developed to effectively isolate, determine, and clean up contamination. Yet, at VYNPS, there may well not be time for AmerGen to get that experience. The licenses for Vermont Yankee (and AmerGen's other reactors) expire within a short period of time of each other. Potentially, AmerGen will likely experience a "crash course" in decommissioning. It will be forced to decommission several reactors simultaneously. Other companies' experiences in decommissioning reactors demonstrates, however, that both licensees and contractors lack the necessary skills to effectively and efficiently clean up nuclear sites within original cost estimates.[22] Hence, AmerGen's claims that it can handle the situation fly in the face of existing experience and should, therefor, be discounted.

Braggadocio aside, AmerGen faces additional obstacles to successful decommissioning of the VYNPS.

Until recently, cost overruns in decommissioning were guaranteed by the ability of utilities to return to Public Service regulatory boards for increases in ratepayer subsidies (i.e., increased electric rates). AmerGen's power contract in the Purchase Agreement for Vermont Yankee does not provide this option. Given that AmerGen's other acquisitions will be in various stages of decommissioning or nearing the ends of their operating licenses, the burden on AmerGen's parent corporations to subsidize the shortfalls of the AmerGen Vermont, LLC, could be unduly great. Lack of funding, or an effort to decontaminate the site based on a low, under-funded budget,

[22] *Compare* TLG decommissioning studies for the Yankee reactors in Maine, Connecticut, and Rowe, for example, which are in the NRC public document files, *with* final site clean-up costs now projected for these same projects. Either the experience and technique are lacking or the estimates were much too low.

rather than one based on a commitment to fully decontaminate Vermont Yankee, whatever the cost, poses health and safety risks to the public, and, in particular, CAN members. Declaration of Anne Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

2. AmerGen Lacks Experience Managing Aging BWRs such as VYNPS--which lack will place CAN members at risk due to an accident at VYNPS.

A. Through the acquisition of Vermont Yankee, AmerGen is creating a situation in which a single company will operate a fleet of latter-vintage BWRs, all experiencing a

pattern of aging-related degradation. Many of these reactors (Vermont Yankee, Oyster Creek, and Nine Mile Point Unit 1) are older than any of PECO's BWRs. Age-related degradation at VYNPS and these other reactors is further advanced than at any of the reactors currently operated by PECO, significantly limiting the scope of AmerGen's claimed experience in maintaining and operating reactors of this type.

The effects of aging are "synergistic." Degradation of some key affected systems interactively affects degradation in other systems. This, in turn, vastly increases increasing the need for specificity in overall system knowledge, and vigilance and timeliness in even the most routine maintenance. For example, workers at Nine-Mile Point Unit 1 [NMP-1] identified a long, through-wall crack in the reactor's Main Drain Line [MDL] only by visual inspection following a special hydrostatic test of reactor vessel pressure. The crack had not been detected during the previous operating cycle, or during the 2-month long refueling outage. They later determined that the crack was caused by deteriorated packing in Main Steam Isolation valves, which were leaking water onto the MDL. For a number of years, the operators and workers knew that the packing was leaking. Yet is was not scheduled for replacement. Moreover, despite the risk-significance of a break in the MDL, the licensee's analysis did not anticipate the synergistic effect of the leaks on other systems. Worker at the same reactor over the past four years have had to do maintenance on several other systems and pieces of equipment, much of it at significant expense: emergency core coolant condensers (1997 & 1999); core shroud (1995,1997, & 1999); control rod stub tubes (1999).

NMP1 is only two years older than Vermont Yankee . Workers and engineers throughout the industry understand that it is a bellwether for age-related conditions in all BWRs around the county. Hence, a significant issue to consider in a license transfer of the VYNPS is whether the

new operator/owner will have both the technical and financial wherewithal, the "hands on" experience with aging BWR problems, to meet and address VYNPS's evolving special needs. If AmerGen is to become the operator of VYNPS, the NRC must first be certain that AmerGen is capable, in the years remaining on the license, of anticipating and meeting maintenance costs and experiences on the scale NMP-1 has already experienced. Failure to do so will likely result in an unsafe condition at the VYNPS.

AmerGen maintains that, through its acquisition strategy, it will be able to achieve more efficient operate. This, AmerGen claims is can be accomplished through consolidation of the workforce and maintenance activities. Such an approach, however, requires the careful and detailed advance planning of all activities, and tight coordination of the workforce rotation, relying on tightly planned maintenance schedules. This kind of scheduling, however, requires accurate foreknowledge of maintenance needs. The basis for such knowledge, going forward in the nuclear industry, is the NRC's "leak-before-break" methodology. For instance, under current regulations, a licensee must be able to identify a leak of no greater than 7 gallons/minute for a 3"-diameter pipe. Recent experience at aging BWRs (like VYNPS) belies this efficacy of requirement. Leak detection equipment is not accurate enough to meet current standards.

Hence, under an appropriate condition to transfer of the license, AmerGen would be required to modify inspections and leak detection equipment. In addition, AmerGen should be required to institute programs to study the rate of crack propagation. This would allow personnel adequate time for planning and scheduling of maintenance activities. NRC, however, needs to oversee the development and implementation of systems and procedures necessary to provide objective review and ensure that the public health and safety is protected, not just add a license condition.

AmerGen's application does not adequately address AmerGen's lack of expertise or the steps it will take to ameliorate this condition to sufficiently protect the public health and safety. With a tightly packed schedule and a depleted workforce due to "profitability" cuts, AmerGen will not have the flexibility to quickly react to surprises at more or more of its generating stations. For this reason alone the application for license transfer should be denied or a hearing, or conditions should be imposed upon the license to require special additional training.[23]

This situation will increase the accident risk at Vermont Yankee, a risk that would likely harm CAN's members. Declaration of Anne Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and

[23] *See* NRC Power Reactor Event Report Number 36489 (December 6,1999) (James A. FitzPatrick staff noted that the reactor's leak-detection equipment would not meet the 3"-line, 7-gallon/minute requirement, and submitted an exception, LER-36489, stating that the equipment

standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

B. Since AmerGen is a newly formed corporation, we must look to its parent companies to assess their qualifications to own and operate Vermont Yankee and a fleet of nuclear generating stations. The record of these companies is not good enough to warrant license transfer without an in-depth investigation through a formal hearing process.

AmerGen, in application for the license transfer of VYNPS, relies upon the experience of its parent companies, PECO and British Energy (BE), to establish a track record as a nuclear reactor operator. The operating records of PECO and BE are, however, mixed at best, irrelevant in some regards, and alarming in many others. Significantly, AmerGen of Vermont must rely on these controversial histories because it has none of its own, being a newly formed corporation--a mere limited liability shell for another limited liability company.

Much has been made of PECO's (now Unicom's?) "improved" operating record and efficiency during maintenance outages. This emphasis avoids discussing PECO's history of systemic mismanagement and insufficient oversight of worker activities. For example, due to an untrained, incapacitated, and sometimes sleeping work force, safety at Peach Bottom was significantly compromised. This necessitated a complete shutdown of the nuclear generating station for over two years.[24] It is extremely important to note that subsequent improvement in

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could only be expected to satisfy a standard of 25 gallons/minute "in most areas" thus, shockingly, leaving open the question of whether leaks would be detectable at all in some areas and systems).

[24] Associated Press, *Both Would-Be Vermont Yankee Buyers Cited Repeatedly* (Aug. 6, 1999). Exhibit 17, attached hereto.

performance at Peach Bottom has been sustained by a regulated utility environment, in which costs of improvements in operations and management -- including reorganization, retraining, and the two-year outage -- have been paid for, or significantly mitigated, by nearly bottomless pockets of guaranteed ratepayer subsidies through increased electrical rates.

AmerGen is buying reactors with similar or equivalent management and operational problems as those PECO experienced at Peach Bottom. While AmerGen's claim that it will honor current union contracts for the immediate future, and at least delay reduction of the VYNPS workforce, its ability to improve operations and management at facilities it owns is significantly compromised by the lack of ratepayer subsidy for outage and other improvement-related costs at VYNPS. Moreover, AmerGen has allowed for a 6 months outage at each of the nuclear stations it owns. This sequencing will allow it to shift personnel around to meet its needs for experienced workers. Outages, however, do not simply run concurrently because an owner/operator schedules them as such. Often they are triggered by unplanned events. So AmerGen's approach to "economy" in this regard is also unsound. For this reason, to the extent AmerGen's claimed abilities are based upon PECO's history of "improved" reactor performance, operations, and safety, such "history" is largely irrelevant to AmerGen's ability to safely operate Vermont Yankee in an increasingly deregulated electric market.

British Energy [BE], unlike PECO, is a relatively new nuclear reactor operator. It was formed only 4 years ago in 1996.[25] BE does have some limited operating experience in a competitive market environment. Its track record, however, under such conditions is hardly a recommendation for qualifying to own and operate U.S. nuclear generating stations.

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[25] Hudson, Nick, *Six Year Change That Cost 45,000 Jobs*, PRESS ASSOCIATION NEWS FILE (October 6, 1996). Exhibit 18, attached hereto.

BE has, thus far, tried to make nuclear reactor holdings profitable by wholesale firing of experienced nuclear workers, subcontracting large portions of key maintenance activities which had been the province of an experienced workforce, and eliminating entire areas of nuclear safety and operations. These practices bespeak the character of the licensee. Character of the licensee is an appropriate issue in a proceeding to transfer a license. *Georgia Power Co,*. 38 NRC 25 (1993, CLI); *Metropolitan Edison Co.*, 21 NRC 1118 (1985, CLI). Given that this foreign company has 50 % ownership and management control over AmerGen, the NRC should not allow the "slash and burn" profit churning management style of a Murdoch or Maxwell to become the "streamlined" U.S. nuclear operations in a deregulated, competitive environment.[26]

Given that NRC currently operates under stringent budgetary constraints, its has vowed to eliminate "burdensome" regulations to help the nuclear industry become more competitive, and its cut-backs of inspection programs and shift to industry "self-monitoring" all bode a lessening of regulatory oversight-- allowing importation of the BE model to take hold here is a sure recipe for disaster.

One has only to look at the effects of BE's UK policies to see clearly what is in store under its subsidiary AmerGen:

1. an overall workforce reduction of 30% at its 11 operating reactors and at some facilities as high as a 30% reduction;[27];

2. reliance on excessive and undocumented overtime;

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[26] The NRC has a charge under the Atomic Energy Act not to permit foreign ownership of U.S. nuclear reactors. See, e.g., 42 U.S.C. §2232 (concerned with, in pertinent part, citizenship of license applicant, common defense and security, and adequate health and safety findings before issuance of license); 42 U.S.C. § 2133 (no license may be issued to an alien or any foreign owned or controlled corporation); similar restrictions are found in 42 U.S. 2134(d).

[27] Reguly, Eric, THE TIMES (October, 10, 1996). Exhibit 19, attached hereto.

3. incidents where BE had too little staff to adequately respond to system failures, such as during the station blackout event at Hunterston B in December, 1998;[28]

4. the lack of a single expert in severe nuclear accidents on staff for the whole fleet of nuclear facilities;[29]

5 the routine use of unqualified contractors and subcontractors, with little or no experience in nuclear facilities or regulations;[30]

As a result of BE's incredible purely profit driven risk-taking, the British Nuclear Installations Inspectorate [BNII] issued a report which orders BE to halt plans for continued workforce reduction (BE's "Vision 2000" program). BNII also ordered BE to and direct immediate attention to resolving gaps in its management and inadequate standards in hiring contracted work.[31] In terms of ensuring the public health and safety, BE's experience is problematic at best, very likely deeply flawed, and certainly discouraging.

Worse, however, is that BE's methods already appear to dominate AmerGen's approach to its new acquisitions. For example, AmerGen's plans for increasing efficiency at Vermont Yankee (and its other reactors) are similar to BE's. AmerGen has stated it plans to reduce the work force by approximately 20-30%. This massive "downsizing"--i.e. firing of experienced personnel--will be supported by consolidating many activities among its fleet of reactors. Workers will have to serve on crews that rotate among various facilities. Certain management functions will be consolidated at the regional or corporate level. This is the same BE plan that the

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[28] *Storm Sparks Major Nuclear Alert At Plant*, SCOTLAND DAILY RECORD (Dec. 30, 1998). Exhibit 20, attached hereto.

[29] Nuclear Installations Inspectorate, *Safety Management Audit of British Energy Generation Limited and British Energy Generation (UK) Limited*, § 4.2.1, No. 59, Ownership and Control, at 12 (1999). Exhibit 21, attached hereto.

[30] *Id.* at 28, Recommendation No. 134

[31] Health and Safety Executive, *HM Nuclear Installations Inspectorate Safety Management Audit of British Energy Generation Limited and British Energy Generation (UK) Limited* (1999)

BNII ordered BE to significantly revise or curtail for safety's sake at BE's UK facilities. It is unrealistic and unwise for the NRC to expect that AmerGen will be able to utilize BE's experience as BE has been directed to completely overhaul the practices it wishes to use to credit AmerGen with operational experience.

Given the irrelevance of PECO's operating experience to VYNPS's problems, and BE's abysmal record, AmerGen's reliance on its parent companies' operating experience should be rejected in the application for license transfer at issue here.

Unfortunately, AmerGen's "experience" deficit does not end here.

BE has no experience with U.S. reactors. It has non with U.S. BWRs (like VYNPS). It has none with aging BWRs (like VYNPS and the other facilities in its "portfolio"). Hence, crediting AmerGen for BE's "experience" in the UK reactor operations, even if they were not disastrous, would be misleading at best. Furthermore, adaptation of BE's strategies for competitiveness to its fleet of aging nuclear U.S. reactors necessitates integration of PECO's BWR experience and BE's management strategy. Since the license transfer application provides no assurance that AmerGen has identified these issue as problematic, much less begun to examine in any way the root-causes of the problems, AmerGen's application to take over Vermont Yankee is simply insufficient to have reasonable assurances that they would protect the public health and safety. For these reasons, the license transfer application should be rejected. Additionally, reliance upon such representation, with the resulting likelihood that shoddy management practices will be used to make VYNPS "competitive, will result in unsafe and dangerous conditions leading to an increased risk of accidents. Such accidents will harm CAN's members. Declaration of Anne

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[HSE, *Safety Management Audit*]; *see also* McGuire, Kevin and Paul Brown, *N-Plant Cuts Put Safety at Risk*, THE GUARDIAN (December 20, 1999). Exhibits 22 and 23, attached hereto.

Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, establishing proper parameters for the handling and accumulating of adequate decommissioning funds, and assuring that AmerGen have the level of competence necessary to safely operate VYNP would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

2.B.1. AmerGen's Policy Of Cost-Cutting Though Job Cutting Jeopardizes The Health And Safety Vermont Yankee Workers And The Public; Absent License Transfer Conditions Requiring a Base Level Of Staffing For Full Time Employees and Contractors To Assure Safe Reactor Operations, the License Transfer Must Be Denied.

CAN is concerned that AmerGen intends import British Energy's Vision 2000 cost cutting practices to the U.S In its two most recent U.S. acquisitions, AmerGen has acknowledged that it

will cut positions. A skilled workforce is the first line of safety defense in nuclear reactor operations. Thus, AmerGen's job cutting practices raise serious health and safety concerns for the safe operation and decommissioning of Vermont Yankee (and all of AmerGen's "nuclear fleet"). This means an increased likelihood of accident, and more likely harm to CAN and its members. See Declaration of Anne Britton, Exhibit 1, attached hereto. A safety conscious work environment is essential for the effective operation of any nuclear generating station. As has been found in other Region I reactors, such as the Millstone reactors, a chilled work environment undermines the willingness of workers to safely report problems that affect safe operation of a reactor.

At the Clinton reactor, AmerGen plans to fire more than 20% of the current work force over the next three years.[32] Thus, about 200 of the station's 930 employees will be "phased out." In May 1999, AmerGen had laid off 80% of Clinton's contractors with more layoffs expected.[33]

AmerGen in its acquisition of Oyster Creek, is committed to firing 10% of the 700 person workforce under the proposed sale.[34] This latest 10% job reduction is in addition to a 10% reduction in the workforce which occurred before the sale.[35]

Although there have been no direct pronouncements from AmerGen concerning the number of proposed layoffs at its newly acquired Three Mile Island nuclear generating station, AmerGen acknowledged that there would be layoffs. The new owners of the Three Mile Island

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[32] Lantau, Kelly, *Clinton Power Plant To Cut 200 Jobs by 2002*, THE PANTAGRAPH (Sept. 10, 1999). Exhibit 24, attached hereto.

[33] *See Herald* article at: www.herald-review.com/03/clinton0911-9.html (up to 200 will lose jobs in next five years); *see also*, posting to www.roadwhore.com, bulletin board for contractors, from spider-t1053.proxy@aol.com (May 12, 1999) (worker claims massive cuts made at Clinton).

[34] Associated Press, *Oyster Creek Nuclear Power Plant Expected to Have Layoffs* (January 15, 2000). Exhibit 25, attached hereto.

[35] Moore, *supra* note 21. Exhibit 16, attached hereto.

nuclear plant expect to "outsource" security operations to a Florida-based company starting next month. Layoffs of guards are expected.[36], [37]

Once layoffs have taken place, workers still at these facilities --and VYNPS will surely be one of them unless there are conditions placed upon the transferred license -- are in for lots of overtime. *See generally*, Declaration of David Lochbaum, ¶9 (a), and attachment to same, Exhibit 'B', a report on overtime and its effects in the nuclear industry. As Mr. Lochbaum indicated, this situation makes an accident more likely to occur. Declaration of David Lochbaum at ¶9(a). Thus, CAN's member may be harmed under such conditions. Declaration of Anne Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or cost-cutting impacts upon workers leading to an accident with unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license

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[36] Strawley, George (Associated Press), *Three Mile Island To Hire Outside Security Company* (January 15, 2000). Exhibit 26, attached hereto.

[37] AmerGen's planned cost-cutting through firing plan is apparently the vogue within the nuclear industry. Northeast Utilities (NU) announced its intention in its 'Focus 99' program to eliminate 10% of its workforce by the years end It intends to eliminate approximately 200 workers through early retirement. Northeast Utilities employs about 2000 workers. In addition NU has cut over 400 contractors bring the contractor positions down to 730 positions. The Focus 99 was established to prepare the corporation for the auctioning of NU's Millstone complex nuclear generating stations as part of deregulation. Hamilton, Robert, *NU Offers Early Retirement as a Way to Cut Work Force*, NEW LONDON DAY, (October 9, 1999). AmerGen, among other, has announced an interest in bidding on the Millstone complex. Exhibit 27, attached hereto.

transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

2.B.2. BE's Commitment to Excessive Overtime jeopardizes the Worker and Public Health and Safety and unless there are commitments by the transferee to establish a base level of overtime for both full time employees and contractors to assure the safe operation of the reactor, the license transfer should be denied.

Since AmerGen (and its limited liability subsidiary AmerGen Vermont LLC) have a limited history to assess in terms of commitment to both employee and contractor firings, one must look to the parent company's practices for an understanding of AmerGen's likely management style and strategies . As demonstrated above, BE has been repeatedly cited for its unsafe job cutting practices at nuclear stations in the UK and Scotland. In fact the Nuclear Installations Inspectorate ordered BE to halt its "job reduction" program until BE could demonstrate that the cutbacks would not jeopardize safety. It has yet to do so.[38] BE was repeatedly cited by the Inspectorate for its job slashing which marginalized safety at its nuclear stations. The Inspectorate said that because of a lack of control over the retention of the key skill base and the intelligent customer

[38] *Safety Watchdog Orders British Energy to Halt Job Reductions*, THE INDEPENDENT (London, U.K.) (January 28, 2000). Exhibit 28, attached hereto.

requirement, they found that the Licensee's capability in some area now resides in single experts and that this is not good practice in a company that operates 11 reactors and provides –20% of the country's energy supply.[39] The Report illustrates another vulnerability which is a shortage or lack of key expertise in irradiation embrittlement, and autenitic steel inspection, an essential department considering aged- related deterioration at nuclear generating stations.[40]

BE's inability to effectively assess appropriate job cuts marginalize safety at its nuclear generating stations. A loss of experienced workers or the extensive overwork of a smaller pool of worker has adverse effects upon safety. The UK Inspectorate Report team were of the opinion that a "long hours culture" exits within the Licensee-[BE--AmerGen's 50% parent] especially in areas where work pressures are high. The team believed that the data it collected are indicative that BE too extensively reduced resource levels in a variety of areas and this is not good for nuclear safety.[41] Although BE believed that job cutting entailed "trimming the fat" in the corporation, and that remaining staff could easily manage the workload (similarly to what AmerGen intends to do at VYNPS and other facilities), this proved to be a false assumption.

The Report found that key in many areas work long hours. Thus, it is not be possible to recover the situation quickly: the vulnerabilities are likely to persist for some years regardless of any counter measures that are introduced.[42]. In reactor systems branch audit, the Report states that:

> This branch exhibited many of the problem common to other areas within Engineering Division, notably: reductions in staff not being matched by reductions in workload: significant levels of overtime working (up to 25% in excess of standard hours with higher short term peaks) and under reporting of overtime; a

[39] HSE, *Safety Management Audit*, *supra* note 31 at 11-12.
[40] *Id.* at 12.
[41] *Id.*, No. 69 at 14.
[42] *Id.*, No. 81 at 16-17.

> general view among the staff that specialists are no longer valued within BEGL...and an increasing reliance upon contractors to provide technical support.[43]

BE did not have the systems in place to evaluate either job cutting or the effects such cuts could have in terms of overwork on the remaining workforce and, hence, job performance and safety. For example, loss of staff and excessive overtime work of remaining employees in the "Assessment Branch" created a situation in which the employees had such heavy work loads that the Branch was "unable to undertake the full range of activities which we expect to find, and which they would wish to discharge--for example to follow up on the implementation of modifications at the stations, to investigate root causes of rejected or poor quality cases, or to undertake a more comprehensive review on a same of safety cases."[44]

If these "forced" overtime practices are allowed to be used at VYNPS (or other AmerGen reactors), dangerous results will surely follow. *See generally*, Declaration of David Lochbaum, ¶9 (a), and attachment to same, Exhibit 'B', a report on overtime and its effects in the nuclear industry. As Mr. Lochbaum indicated, this situation makes an accident more likely to occur. Declaration of David Lochbaum at ¶9(a). Thus, CAN's member may be harmed under such conditions. Declaration of Anne Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or cost-cutting impacts upon workers leading to exhaustive overtime, an ensuing accident with unplanned and dangerous releases of radiation,

[43] *Id.* at 29.
[44] *Id.* at 38.

would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

3. Given the historical problems at the Vermont Yankee nuclear generating station, CAN believes that an Environmental Impact Study is warranted before license transfer application is approved to protect the health and safety of the workers and the public.

Vermont Yankee, like other New England reactors, has experienced serious problems with the accuracy of its Final Safety Analysis Report, design bases, and an inadequate safety evaluations program.[45] Vermont Yankee has also had an inadequate operational experience review program, lack of adequate perimeter security, and poorly evaluated DERs.[46] There is

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[45] Lochbaum, David, *Availability and Adequacy of Design Bases Information* (submitted to) Vermont State Nuclear Panel (August 19, 1998). Exhibit 29, attached hereto.

[46] Citizens Awareness Network, *Formal Request For Enforcement Action Against Vermont Yankee*, Docket no. 50-271 (May 27, 1998).

serious cracking in the reactor building's secondary containment concrete walls.[47] This condition is dangerous given the design of the mark I containment in which the irradiated fuel pool is suspended seven stories above ground level in the containment building.[48] Furthermore, Vermont Yankee's performance reporting incidents through LERs is lower than that of the average licensee. Such a deficiency has serious safety significance as it affects the potential for violation of the Tech Specs limiting power distribution.[49]

The last Systematic Assessment of Licensee Performance (SALP) review of VYNPS was downgraded due to deterioration in plant support and weak radiological controls. The NRC inspection also found security problems. Five out of seven NRC inspectors posing as terrorists in a security exercise were able to jump Vermont Yankee's perimeter fence without detection. One even smuggled in a mock gun--a serious indication of lax security practices.[50] During the SALP evaluation period, Vermont Yankee also had at least two reactor scrams caused by operator error, continuing problems in reporting, ineffective radiological oversight, insufficient radiation protection staffing, and significant performance deficiencies.[51] In addition NRC Inspector stated that Vermont Yankee was ineffective in establishing sufficient and positive radiological control technical coverage of significant work involving rehab of the torus, and had insufficient technical

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[47] VY representatives acknowledged as much at a Vermont State Nuclear Panel Meeting, admitting the cracking to be over 20 feet long.

[48] Citizens Awareness Network, Nuclear Information and Resource Service, Union of Concerned Scientists, and New England Coalition on Nuclear Pollution, Letter to William Sherman, Vermont State Nuclear Engineer, (November 15, 1998). Exhibit 30, attached hereto.

[49] Lochbaum, David, *Letter to David Vito, NRC Region I, Allegation Regarding Vermont Yankee LER 97-008* (July 16, 1997).

[50] Screnci, Diane, Region I Press Release, *NRC Assess Performance of Vermont Yankee Power Plant* (August 31 1999).

[51] Lochbaum, David, *Review of the NRC SALP For Vermont Yankee* (September 4, 1998). Exhibit 31, attached hereto.

resources to cover significant radiological control work.[52] Accrued person-rem during the job was approximately twice the original estimates, and necessary man-hours were four times original estimates.[53] AmerGen has not provided the NRC with a plan for solving these endemic problems at VYNPS.

In August of 1999, the watchdog group Public Citizen issued a report criticizing the NRC for permitting so many reactors to continue operation outside design bases.[54] Design bases are the blueprints for the safe operation of any nuclear generating or decommissioning station. Licensees operating outside their design basis are required to document this in daily event reports and file them with the NRC. Between October, 1996, and May, 1999, 102 of 111 operating nuclear reactors reported over 500 instances of operation outside design basis.[55] This was a complete compromise of the NRC's regulatory philosophy of "defense in depth." Leading the list in reactors is Vermont Yankee Nuclear Power Corp. with 47 reported outside-design basis incidents.[56] Although *some* of this reporting related to Vermont Yankee's design basis document program, these reports are a shocking indication of the extent to which Vermont Yankee has operated out of compliance. The report also raises serious concerns about the present and future condition of Vermont Yankee documentation program, unless root causes are established to determine the reasons for this breath-taking failure of documentation and regulation.

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[52] Inspection Report 50-271/98-04 (June 4, 1998).

[53] Citizens Awareness Network , Letter to NRC Questions and Comments to the NRC During the SALP Evaluation (September 16, 1998).

[54] Riccio, James, *Amnesty Irrational How the Nuclear Regulatory Commission Fails To Hold Nuclear Reactor Accountable for Violations of Its Own Safety Regulations*, PUBLIC CITIZEN at 1-6 (August 1999). Exhibit 32, attached hereto.

[55] *Id.*

[56] *Id.*

This failure bespeaks a culture of non-compliance. A culture of non-compliance is a threat to worker and public health and safety. It is a threat to the health and safety of persons living near the VYNPS due to increased risk of accident and the likelihood that contamination at the facility will not be properly documented, and, ultimately, will not be completely cleaned up. Vermont Yankee has documented history of just such a non-compliant culture.[57]

In addition to management, program deficiencies, and worker training problems, Vermont Yankee is an aging boiling water Mark I reactor. It has the same age related deterioration of safety systems as other aging BWRs. In 1996, Vermont Yankee repaired the core shroud because of circumferential cracks over 1" deep in the 2"-thick shroud.[58] Workers refurbished the torus during the 1998 refueling. Many problems encountered during the process.[59] Refurbished the Workers also refurbished the core spray systems during the last refueling, in 1999.

Problems the shroud are bellwethers for problems in 25 back up safety systems which rely upon parts subject to inter-granular stress corrosion cracking. Thus, VYNPS will have deterioration in other systems in the next several years. As professional understanding of the effects of inter-granular stress corrosion cracking is limited, one cannot predict the frequency of necessary repairs, the length of the outage required, or the mounting cost to keep operational such safety systems at Vermont Yankee.

For the reasons stated, CAN contends that an analysis must be preformed to determine the competency and accuracy of Vermont Yankee programs. When an individual buys a house, there has to be an engineering review, a review of water quality, review for potential on site

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[57] *Id.*

[58] Citizens Awareness Network, Letter to the Vermont State Nuclear Advisory Panel, re: *Core Shroud Inspection and Flaw Evaluation* (June 19, 1996). Exhibit 33, attached hereto.

[59] Lochbaum, *supra* note 51, Exhibit 31, attached hereto.

contamination. Buying a nuclear generating station can have grave consequences, not just for the purchaser, but for Vermont Yankee's neighbors (including CAN's members). The need for such pre-transfer of title "reviews" is merely common sense. For the Vermont Yankee sale, a proper full scale engineering review would help to reassure the public that their families and property are safe. CAN contends that a "vertical slice analysis" should be conducted prior to approval of the license transfer. This is all the more necessary given AmerGen's lack of experience, and the serious and longstanding mismanagement problems at Vermont Yankee.

Without such a review, mere "passing of title" will leave hidden numerous problems which have been festering at the facility and threaten occupational and public health and safety under AmerGen's cost cutting approach to competitiveness. This situation will endanger CAN members as hidden defects lead to accidents. Declaration of Anne Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and

standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

Until Vermont Yankee's reporting problems have been solved and the station has been shown to be safely operable within its design bases, the license transfer should be denied.

4. Given the historical problems in NRC Region I, CAN contends that an independent evaluation of the Vermont Yankee Nuclear generating station is required before any license transfer application can proceed.

CAN has documented NRC Region I's abdication of regulatory oversight. The NRC is well aware of the historic, systemic mismanagement at nuclear generating stations in New England. The Millstone debacle has raised serious concerns in communities surrounding these nuclear generating stations over the ability of the NRC to protect the health and safety of both workers and ordinary people who have little power to control the actions of large corporations and conglomerates such as AmerGen.

Since 1996, CAN has petitioned the NRC to investigate NRC Region I in order to understand the root causes for the NRC's miserable regulatory failures in its oversight of the Millstone complex, Connecticut Yankee, Vermont Yankee, Maine Yankee, Pilgrim, and Yankee Rowe.[60] In fact, portions of the key petition are *still* pending. The NRC has yet to determine the root causes of chronic, systemic mismanagement, and the deficiencies in the NRC regulatory

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[60] *See, e.g.*, Citizens Awareness Network, *Petition For Enforcement, Pursuant To 10CFR 2.206 To Revoke Northeast Utilities Operating Licenses for the Connecticut Nuclear Power Stations Due To Chronic, Systemic Mismanagement Resulting in Significant Violations of NRC*

oversight in Region I, which allowed (and continue to allow) deficiencies to exist at nuclear generating stations, appears intact. A proper analysis of this lapse in oversight would have increased public confidence in the NRC's regulatory abilities, and, more important, allowed the NRC to implement effective solutions to the problems. CAN has zero confidence that the NRC's current risk-based regulatory approach will do anything positive about the Region I deficits. In fact, such an approach will only further confound the apparent regulatory anarchy in Region I.

Public Citizens issued a report on NRC oversight which reaches a similar conclusion to CAN's concerning endemic problems. The Public Citizen report concludes that the frequency and quantity of design basis documentation problems it reviewed could only occur (and persist) in the absence of effective NRC regulation and oversight.[61]

Until the staff deficiency in Region I is resolved, CAN contends that, in order to protect the health and safety of the workers and the public who will likely be harmed if the Vermont Yankee license is transferred to an inexperienced company with a poor performance history, the NRC must commission an independent analysis to determine the actual condition of Vermont Yankee. The license transfer should be denied until the NRC has completed and reviewed a detailed analysis of Vermont Yankee. Such an analysis will serve the dual role of informing AmerGen of the nature and extent of any and all systemic problems at VYNPS. It will also preserve "institutional" memory concerning spills, contamination, and other decommissioning and site clean-up related matters. As the new owner will be shifting personnel, without such an intensive study now, information crucial to effective site remediation will be lost. *See* Declaration of David Lochbaum at ¶9(c), Exhibit 2, attached hereto. Unlike Maine Yankee, which Mr.

Safety Regulations, and To Investigate the NRC's Staff's Responsibility For Not Dealing With This Problem For Over A Decade at 1-6, 18-22 (November 25, 1996)

Lochbaum uses as an example of the process that should be undertaken at VYNPS, VYNPS is about to have a new owner and undergo personnel changes. Steps, as Mr. Lochbaum points out, for sound reasons of public health and safety, should be taken now to preserve this information intact. *Id.*

Failure to order such an analysis prior to sale places CAN members in the neighborhood at risk. Declaration of Anne Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

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[61] Riccio, *supra* note 54, Exhibit 32, attached hereto.

examination of evidence and witnesses provides. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

5. Given AmerGen's lack of expertise in a deregulated market, CAN contends that the license transfer should be denied until AmerGen and its parent corporations establish baseline funding that is clearly defined and substantially increased over current levels to address the dangers to public health and safety inherent in permitting the controversial and risky endeavor in which AmerGen and its parent companies are engaged.

AmerGen has been acquiring a fleet of aging, embrittled nuclear stations beset by a variety of operational problems. These problems include mismanagement, under capitalization, lack of irradiated fuel storage capacity, lack of adequate and assessable FSAR (or design-basis documentation problems).[62] Clinton was down for two years. Oyster Creek was going to close, and actively preparing for closure through exemptions and changes in procedures. Vermont Yankee, while apparently intending to continue operation of the VYNPS, spent several years pouring large amounts of money and time into design basis documentation and many repairs. Yet, during that time--approximately the past four years--Vermont Yankee did not solve the looming problem of lack of irradiated fuel storage capacity, including dealing with structural cracks on the ground floor of a building in which irradiated fuel is stored in a pool on the seventh story. The reduced value of VYNPS due to its age, embrittlement, and lack of fuel storage capacity may explain the curious fact that, although the Vermont Department of Public Service found the VYNPS to have a present value of $176 million a year before it was sold, at sale to AmerGen, the

[62] *See* Ryan, Margaret, *IP Paid To Get Rid of Clinton But Recouped in Stock Value*, 40 Nucleonics Week at 3 (November 18, 1999) (analyst finds AmerGen's attempt to acquire numerous nuclear facilities is risky business that entails not only raising capital for purchases and operations, but also being able to meet needs of decommissioning trust funds). Exhibit 34, attached hereto.

price of VY was only $23.5 million (with a buy-down contingency for a reduction in that price by $90,000 per day, down to $10 million, for each day the approvals for the deal are not in place between July and December of 2000).

CAN contends, thus, that the sale at issue here is not a mere "administrative" formality. Rather, it is, one may only hope, an aberrance in the license transfer process, i.e., the proposed transfer of a Part 50 license to operate absent any adequate assurances of the ability and financial wherewithal to assure safe operation.

AmerGen is committed to acquiring up to 100 nuclear power generating stations in the US and Canada (under it CanaGen subsidiary).[63] AmerGen applied for NRC license amendments to transfer the license at each station it purchased. Because the NRC's regulations permit a potential licensee such as AmerGen to, in effect, segment the process of acquiring a "fleet" (or as they say, "portfolio" of US reactors), the individual separate proceedings which occurred (supposedly mere "administrative" shifts in who possesses the license to operate) are blind to the accumulated risks in a corporation's attempt to operate a large fleet of reactors. Significantly, the NRC has never contemplated dealing with a utility that stated its wanted to buy up nearly all the reactors in the United States. Certainly, the NRC's watching this process go down piecemeal without any proper study of the environmental impacts of such a massive shift in the ownership and control of the U.S. nuclear electric generating capacity violates the letter and spirit of both NEPA, 42 U.S.C. §§4321, *et seq.*, and the AEA, 42 U.S.C. §2133. For this reason also, the NRC should provide a full adjudicatory process on this license transfer matter, now that AmerGen's intentions are plain. Such a hearing will allow the NRC to properly explore the ramification of AmerGen's

desired centralization of nuclear power generating capacity, along with the parallel issues of impacts upon the human and natural environment, and the health and safety effects of such a potential concentration of responsibility.

AmerGen's reactor acquisitions are aging and embrittled. In all likelihood, AmerGen will face many unscheduled outages, costly repairs, and untimely shut downs, simultaneously at many of its nuclear power stations. AmerGen's application for license transfer does not resolve the issue as to whether AmerGen has sufficient resources or expertise to deal effectively with the emerging situation its bulk purchases will create. These license transfer applications may meet present NRC requirements, but we believe that the acquisition of Vermont Yankee must be evaluated in the context of these present and intended acquisitions. Therefore we again urge the NRC Commission to broaden the scope of these proceeding to encourage such an examination.

Under a related case in which Nuclear Information and Resource Service [NIRS] filed to intervene in the sale of Oyster Creek to AmerGen, AmerGen's Answer to NIRS Petition to Intervene states that it is not unusual for nuclear utilities to form limited liability holding companies.[64] This, however, is not a usual situation in the nuclear industry. Other nuclear utilities have formed holding companies. But those were companies whose parent companies had already demonstrated both expertise and financial assurance necessary for safe operation and decommissioning of their nuclear reactors. Significantly, again, the financial competence of such companies was guaranteed by their ability to seek and gain approval for rate increases through state regulation and ratepayer subsidies. Under deregulation of the electric utility market,

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[63] *See* British Energy website at www.ukbusinesspark.co.uk/bry44970.html; *see also Are AmerGen Partners Moving into Canadian Nukes*? 14 THE ELECTRICITY DAILY (January 4, 2000). Exhibit 35, attached hereto.

ratepayer guaranteed subsidies are gone (or soon to be gone). In this situation, the NRC owes the public the demand for a higher level funding assurance from nuclear reactor buyers such as AmerGen.

AmerGen has no track record to take to the bank.. It will have no rate base to subsidize it when need arises at VYNPS (and its other holdings--whose needs could impinge on its ability to assure continued safe operation of VYNPS). It is a newly formed corporation that has only recently acquired nuclear generating stations. Any experience it claims to issue from these very recent acquisitions can only be so limited as to be meaningless in predicting whether it can and will be a safe owner/operator of yet another holding, VYNPS. It has neither the expertise nor necessary financial qualifications to guarantee its ability to adequately operate and decommission a fleet of nuclear stations in a deregulated energy market. Significantly, no where in its application (at least the portions available to the lay public and would-be intervenor) does AmerGen provide any meaningful assurances to the NRC in this regard.

AmerGen's acquisition of aging, embrittled nuclear generating stations in a deregulating market with uncertain decommissioning cost, and a lack of clear waste disposal possibilities, is, by any normal business standards, risky business at best. Such risk demands of the NRC a heightened level of scrutiny than the mere administrative formality of a subpart M license transfer process.

In this regard, if NRC regulations are presently ill equipped to contemplate these evaluations, then these license transfer proceedings should be halted until such time as NRC has established the necessary criteria to make such evaluations. CAN does not mean to suggest that

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[64] Oyster Creek, Docket No. 50-219 License No. DPR-16 Applicant's Answer to Petition for Leave to Intervene of Nuclear Information and Resource Services at 13-14 (January 13, 2000).

its request for hearing be diverted to a rulemaking--rather that the agency owes the public a level of confidence that regulations like subpart M, which appear to be enacted solely for the convenience of corporate reactor purchasers, are not the appropriate venue for the AEA mandated health, safety and national security findings the NRC needs to make in this case.

Failure make such evaluations prior to sale places CAN members in the neighborhood at risk. Declaration of Anne Britton, Exhibit 1, attached hereto. Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds, and preserving institutional memory within the context of a broad-based independent review of the entire VYNPS facility would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. It needs the intensive investigatory power which cross examination of evidence and witnesses provides. Therefore, the NRC should, pursuant to 10

C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

6. **NRC has not adequately examined the implications of AmerGen's commitment to establish a fleet of nuclear power stations in America and Canada in light of the serious anti-trust implications of such a fleet in the hands of a what is, essentially, a single company. These implications include, but are not limited to: (a) regional energy dependence on a single supplier, a matter potentially adverse to the national interest and national security, (b) health and safety issues for workers and persons living in proximity to Vermont Yankee or any of the facilities in the event that the single corporate holder is unable to maintain the necessary capital flow for operations, maintenance, repairs, and/or decommissioning, and (c) foreign domination of a corporation in control of a large portion of the U.S. nuclear electric generating capacity.**

AmerGen has committed to acquiring up to 100 American nuclear stations.[65] It is committed to acquiring nuclear stations in Canada.[66] AmerGen and its parent companies PECO (UniCom) and BE have not demonstrated that they have the adequate funding to pursue their endeavors. PECO Energy owns and operates four nuclear stations (Limerick 1 and 2 and Peach Bottom 1 and 2), and holds an interest in Salem 1 and 2. In addition PECO has merged with Unicom Corp. which owns and operates 10 reactors and 3 decommissioning reactors.[67] British Energy owns and operates 11 reactors in the UK. AmerGen has acquired Three Mile Island, Clinton, , and is attempting to purchase Oyster Creek and Vermont Yankee, and intends to purchase more U.S. reactors. In all likelihood AmerGen, its parent companies, and its subsidiaries could control 25% or more of the nuclear generating capacity in the US and a significant amount of the world's nuclear generating capacity in a very short time.

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[65] British Energy website: www.ukbusinesspark.co.uk/bry44970.html at UK Business Park Company Search 2000.

[66] Shad, David, *British Energy Eyes Canada Plant*, THE SCOTSMAN PUBLICATIONS LTD. at 16 (December 20, 1999). Exhibit 36, attached hereto.

The NRC has a Congressionally mandated oversight duty on antitrust matters in license transfer proceedings under Atomic Energy Act of 1946, as amended 1954, et seq [AEA]. §§105, 184; 42 USC §§ 2135(c), 2234, and related portions concerning the licensing of nuclear facilities and the NRC's oversight authorities for such licensees. The NRC, in the interests of public and occupational health and safety, must exercise this antitrust investigative power which Congress mandated in all licensing actions. The purpose of this express grant of authority and mandate for action in AEA § 105 and 184 and related portions of the Act, is to prevent any regulatory gap in the approval of a highly dangerous activity--NRC licensee operations of nuclear powered electric generating facilities. Such NRC licensee operations endanger employees and persons living and working in nearby communities on a daily basis. They also endanger larger populations and the natural environment given the possibility of accidents which could contaminate rivers and drinking water sources, as well as land, air, people, crops, livestock, and domestic animals. They endanger CAN and its representative member. Plainly, such dangers are multiplied in the event an NRC nuclear licensee cannot meet its financial obligations due to financial shortfalls which could easily be triggered due to the effects of over-reaching in ownership of such facilities. This is a situation which must be investigated fully in the context of this license transfer application considering the issues set forth herein above.

In addition, given the age of many of the facilities now up for sale, financial problems could also occur due to multiple closures of facilities precipitated by accidents, repairs, enforcement actions, decommissioning, and various combinations of such events. Thus, to characterize an antitrust analysis as relating strictly to administrative matter and financial

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[67] Salpukis, Agis, *PECO and UNICOM To Merge In Big Bet On Nuclear Power*, THE NEW YORK TIMES at C-5 (September 24, 1999). Exhibit 37, attached hereto.

considerations is to fail to see the proverbial forest for the trees The health and safety problems which may arise due to NRC permitted conglomeration of nuclear reactor holdings is not at all speculative, particularly in the context of AmerGen's current buying pattern, the behavior and ownership responsibilities of its parent companies, and the historic problems the reactors AmerGen is acquiring and those owned by its parent companies, and AmerGen's commitment to acquire 100 nuclear generating facilities. In the event that incidents at its holdings trigger acute cash flow problems, due to the fact that multiple nuclear facilities are involved, the consequences could range from "mere" losses of power to large segments of the country during times when it is vital (e.g., winter cold conditions), to failure to prevent (or triggering) nuclear accidents, releases of nuclear material and radiation from facilities (with the incident harm to persons and property on a massive scale).

Moreover, in a competitive environment, owners of a large number of nuclear facilities--as AmerGen wants to be and is on its way to becoming-- will likely try to cut costs in every available way to maximize their profits, including the kind of overtime practices described by CAN's expert, David Lochbaum and detailed in attachment Exhibit 'B' to his Exhibit 2 Declaration attached hereto. These likely scenarios Mr. Lochbaum describes pose genuine risks of harm to CAN and its members. Only under a full and formal adjudicatory process will the NRC acquire the kind of information necessary to place conditions on the license that will protect CAN and its members from harm.

Recently, in a yet to be completed rulemaking under which the NRC proposes to relinquish by interpretation the Congressionally mandated antitrust power it must exercise in granting licenses, the NRC has advanced the claim that a "lack of resources" to conduct antitrust evaluations at proposed licensed transfer is a reason to stop conducting such evaluations. Yet,

considering such a resource allocation decision, nowhere in its cases or rulemaking does the NRC analyze the potential for harm faced by persons such as CAN's members, when failure to exercise that oversight at the license transfer stage leads to the need to exercise enforcement authority or supervise clean-up of a major accident due to violations of significant health and safety regulations at Vermont Yankee when it is owned by a single corporation under the burden of operating many, many nuclear facilities.. In this way, the NRC's failure to conduct the kind of antitrust review Congress desired in a case like the one before it now is not only illegal, but endangers public and occupational health and safety, in particular, that of CAN and its members in Vermont. The NRC has not considered the costs and benefits of exercising the antitrust authority at license transfer stage in a case like this waiting to solve potential problems via inspection/enforcement. With an increased regulatory burden on the NRC's already shrunken and overworked inspection staffs, its will be difficult to offer adequate protection to persons, such as CAN's members, when owners, like AmerGen, of multiple reactor facilities end up, under a cost-cutting attempt to maximize profits, with widespread health and safety violations at many different locations. Every locality, every reactor "community" --like the one CAN's Vermont members are in, will suffer the ill effects of the NRC failure to do the job Congress mandated it to do up front, at the licensing stage. Additional potentially serious accident triggering scenarios arise when one considers overtime patterns within the nuclear industry. *See*, Union of Concerned Scientists, Overtime and Staff Problems in the Commercial Nuclear Power Industry (March 1999), attached hereto as Exhibit 'B' to Exhibit 2, Declaration of David Lochbaum.

Apparently, the NRC does not even have the resources necessary to follow out a simple risk assessment of the chains of events which plainly follow when a large-scale owner bent on maximizing profits takes either or both paths of increasing overtime coupled with staff-cutting,

and/or firing qualified personnel and trades union members for replacement with lesser skilled and experienced contract labor. (Even when such contract labor is skilled and experienced, the skills and experience are not completely fungible--each nuclear facility, particularly the older ones which are now purchased on the cheap, having site-specific, particularistic configurations, problems, and out-of-usual design solutions.) The NRC has not done what Congress most clearly and plainly authorized and mandated in the Atomic Energy Act: evaluate the health and safety and national security consequences of actions in the process of nuclear licensing, production, operations, waste storage, and clean-up.

The NRC also fails to even evaluate, based upon any study of its own records in this regard, whether there are increased numbers of violations of NRC regulations among those facilities already owned in bulk by some licensees, the overtime and hiring practices of such licensees, and related matters. Failure to conduct the mandated antitrust evaluations prior to license transfer, as shown above, jeopardizes the human and natural environment. Thus, the NRC failure to conduct such antitrust evaluations during this period of rapid consolidation of nuclear reactor holdings under giant, partly foreign controlled mega-corporations, is, in itself, a major federal action affecting the quality of the human and natural environment. In this way, the NRC's failure to conduct an EIS of its decision to stop doing what Congress required under the AEA violates the National Environmental Policy Act, 42 U.S.C. §§4321, *et seq.*

The NRC states that "there will be no realistic gap in antitrust law enforcement if the NRC no longer performs antitrust reviews of post-operating license transfer applications." *Kansas Gas and Electric Company* (Wolf Creek Generating Station, Unit 1), CLI-99-19, 1999 NRC LEXIS 85 at *57, n22 (June 18, 1999). This conclusion, an historic about-face in the NRC's struggle to maintain regulatory hegemony over all matters nuclear, fails to consider that Congress mandated

such reviews in operating licenses under its grant of discretion and authority to the NRC to ascertain that any nuclear related license which the NRC issues does not go to a foreign power or foreign dominated corporation, and is neither inimical to public and occupational health and safety nor national security. AEA § 184. This is not a strained interpretation. It is one that should be plain to anyone reading the statute as an entirety, instead of in a segmented way.

Furthermore, CAN's members' health and safety are jeopardized by the NRC's failure to conduct antitrust evaluations of the AmerGen license as no other agency which reviews this transaction is empowered to examine the antitrust implications of a licensing (or transfer of license) from the perspective of such an action's impact upon occupational and public health and safety and national security. Abdication of the AEA's Congressional charge to the NRC to conduct such antitrust evaluation and to make particular types of findings in granting (or transferring) of a license creates a dangerous gap in the regulatory scheme enacted under the Atomic Energy Act, §§105, 184, and related sections on licensing and issues related to licensing.

Congress, in the Atomic Energy Act, does not separate initial licensing and subsequent transfers in any way recognizing or characterizing the latter as deserving lesser attention from the NRC in antitrust matters. Nor, significantly, does the Atomic Energy Act or any other legislation lift from the NRC's shoulders the "burden" of making the requisite inquiries under AEA § 105 and 184. Furthermore, any silence on this difference, or lack of clarity which might be found in the statute, should be resolved using common sense and customary practice in language not the NRC's disinclination to deal with the issues or alleged lack of resources. It should also be resolved by reading the entire statute together as a whole, given the broad charge to the NRC to conduct its investigations for the purpose of assuring that public health and safety be protected and that the national interest be safeguarded in dealing with all aspects of the licensing of nuclear

production, utilization, and waste disposal. If the NRC's alleged "lack of resources" were intended as a message from Congress, Congress would have, by legislation, tied resource allocation to specific acts or omission, and to changes laws governing NRC practices if it so desired. To date Congress has not done so. In fact, until Congress changes the law, Congress has, by law, directed the NRC to conduct such evaluations.

Unless and until the NRC conduct such antitrust evaluations considering occupational health and safety issues related to the development and licensing of nuclear conglomerates, as well as the national security implications of foreign domination of such corporations, no license transfer should be permitted in this matter. Only by providing a full adjudicatory process in this case will CAN's members receive the kind of assurance they deserve that they will be safe from harm under a license transfer of the Vermont Yankee operating license to AmerGen (or any other company). Failure to order such an analysis prior to sale places CAN members in the neighborhood at risk. Declaration of Anne Britton, Exhibit 1, attached hereto.

Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls, but the radiation dangers of inadequate clean-up or costs-cutting impacts upon workers leading to unplanned and dangerous releases of radiation, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating

of adequate decommissioning funds, and preserving institutional memory within the context of a broad-based independent review of the entire VYNPS facility would cure the harms to CAN and its representative member. This satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. It also involves more than mere financial matters and, thus, implicates a more detailed hearing process than is provided under 10 C.F.R. Subpart M. It needs the intensive investigatory power which cross examination of evidence and witnesses provides. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

7. **AmerGen's parent companies have only committed to put up only $110 million to assure their joint venture has sufficient revenues to safely operate its fleet of reactors. The funds reasonably required to support an endeavor on the scale AmerGen intends far exceeds that amount.. Given that: (a) many of AmerGen's reactors will be in varying state of operation and decommissioning, (b) Price Anderson Act insurance does not cover decommissioning, and (c) decommissioning costs are always uncertain at best, it is plain that AmerGen's generalized assurances are insufficient permit license transfer.**

To adequately assess the implications of Vermont Yankee ownership within the context of AmerGen's intended "portfolio" of nuclear generating companies, the NRC must conduct a full anti-trust review of the transactions, and obtain from AmerGen a clear commitment to substantially increase funding, as requested in issue #6 above. In addition, however, a special account should be created to hold the partners' assets. This would create a degree of financial security sufficient to justify approval of such a risky venture. This is due to the lack of adequate insurance coverage under Price Anderson to cover complete cleanup. Declaration of David Lochbaum at ¶9(b), Exhibit 2, attached hereto. As Mr. Lochbaum states:

> The license transfer may increase the potential for people not being compensated for illnesses or property damage caused by radiation released from the Vermont Yankee site. During the period of the operating license, the public is guaranteed under the Price-Anderson Act of 1957 and its amendments for compensation. The Price-Anderson liability coverage ends when the operating license is terminated even though radioactive material could remain at the site in harmful amounts. The change in ownership may make it more difficult for any person suffering loss caused by the release of radioactivity from the Vermont Yankee site after license termination to receive compensation.

Id. AmerGen has provided no assurances to the NRC concerning its financial abilities to cover contingencies outside Price Anderson insurance coverage as Mr. Lochbaum described it above. Given that CAN's members want to be able to freely enjoy the coast of the Connecticut River where Vermont Yankee now lies, the inability to compensate persons harmed from an incomplete cleanup is a genuine concern. The NRC should not allow the license transfer in this case without a full adjudicatory hearing on this issue in order to determine how AmerGen would deal with the indemnification and compensation issues. Moreover, failure to address this issue would be a harm in itself to persons such as CAN's representative member who want to be able to enjoy the natural environment in the area now occupied by Vermont Yankee. To be unable to freely hike and recreate there for fear of both contamination and in inability to obtain any recovery for radioactive contamination due to such activities is a genuine harm. See Declaration of Anne Britton, Exhibit 1, attached hereto. the NRC's failure to order full hearing on this issue places CAN members in risk. Declaration of Anne Britton, Exhibit 1, attached hereto.

Not only could she suffer property damage due to increased electrical rates in the event that under emergency conditions, AmerGen would be able to litigate to affect rate increases to try to meet its shortfalls due to incomplete clean-up and no post-Price Anderson qualified insurance coverage, but the radiation dangers of inadequate clean-up, leading to dangerous radiation left on

site, would harm her health and safety and harm her ability to enjoy the natural environment around her, and, in particular, utilize the Vermont Yankee site after final site release.

If the NRC holds the requested hearing, CAN will have an opportunity to present evidence to the Commission (or ASLB panel) which could lead to conditions being placed upon the license transfer that would avoid the harm to CAN (and its representative member). Conditions controlling hours, overtime, and establishing proper parameters for the handling and accumulating of adequate decommissioning funds, and preserving institutional memory within the context of a broad-based independent review of the entire VYNPS facility, analyzing the antitrust implications of the sale, conducting an environmental study of the site, and dealing with this indemnification issue would cure the harms to CAN and its representative member.

As such, this issue, along with all the others, satisfies the requirement of 10 CFR §§ 2.1306 , 2.1308 for an admissible interest and standing, and this issue should be taken up for hearing. As the issues raised involve more than mere financial matters, a more detailed hearing process than is provided under 10 C.F.R. Subpart M is appropriate in this case. To resolve the mattes CAN has raised requires the intensive investigatory power which only the proverbial engine of cross examination of evidence and witnesses can provide. Therefore, the NRC should, pursuant to 10 C.F.R. § 2.1329(b), upon need to resolve such special issues not properly within a simple license transfer, conduct a 10 CFR Subpart G proceeding.

CONCLUSION

For the reasons set forth above, CAN requests a full, substantive hearing on the license transfer request at issue, and the granting of the Petition to Intervene in such a hearing, and that its motions in this matter be granted.

DATED this 22 day of February, 2000.

Respectfully submitted:

CITIZENS AWARENESS NETWORK, INC.

BY: _____
Frederick Katz, President, CAN

BY: _____
Deborah B. Katz, Executive Director of CAN

pro se for CAN

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(413) 339-5781

cc: Office of Secretary;
Service List

Exhibit 1

Declaration of Anne Britton
(CAN member authorizing CAN to represent her interests in this matter and supporting standing)

Before the
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of Vermont Yankee Nuclear Power Corp. Application for transfer of Part 50 license for Vermont Yankee Nuclear Power Station to AmerGen Vermont, LLC	Docket No. 50-271

DECLARATION OF ANNE BRITTON IN SUPPORT OF CAN'S STANDING

I, Anne Britton, state the following as true:

1. My name is Anne Britton.

2. I reside at 29 Retting Place, Brattleboro, Vermont.

3. I have lived at that address with my husband and son for about 2 1/2 years.

4. The place where I live with my family is approximately 6 to 6 1/2 miles from the Vermont Yankee Nuclear Power Station in Vernon, Vermont.

5. I am also an electric utility ratepayer for Central Vermont Public Service Company which sells electricity generated by Vermont Yankee.

6. I have concerns for the health and safety of my family because we live so close to the Vermont Yankee Nuclear Power Station.

7. I am a member of the Citizens Awareness Network, Inc. [CAN], and have authorized CAN to represent in this matter.

8. I have am aware of the issues that CAN is raising in this proceeding and agree with the concerns that CAN has, as I share those concerns.

9. I have also read the Declaration of CAN's expert in this matter, David Lochbaum, and share the concerns he expresses in his Declaration.

10. In particular, as I enjoy walking, hiking, and some biking in this area, I would like to be able to hike and walk in the lands now occupied by the Vermont Yankee Nuclear Power Station--if they can be completely cleaned up of any radioactive contamination so that it is safe to be there. I am concerned that whoever owns Vermont Yankee has the experience and financial ability to completely clean up the site for release to the public when the useful life of the plant has ended. In this way, the license transfer matter has a direct bearing on the possibility of my being able to safely enjoy the natural environment in this area. I think that the NRC should conduct a full environmental assessment of the Vermont Yankee facility to determine the extent of contamination there so that it can be sure that any new owner has the financial means necessary to clean up the site. Also, given the history of lack of oversight in many other reactors in the New England area, I would like to see the NRC conduct an independent evaluation of the Vermont Yankee Nuclear Power Station so that people living nearby, like me and my family, would be certain that all of the problems with the reactor are known and documented before a new owner takes over.

11. I am also concerned about the problems which may arise if the license to operate Vermont Yankee is transferred to a company lacking experience in dealing with operating a Boiling Water Reactor. In particular, I am concerned about license transfer to a company such as AmerGen which does not have experience dealing with an aging nuclear reactor like Vermont Yankee. In addition, I am concerned about what I have heard concerning the overtime practices and job-cutting which the parent companies of the would-be owner, AmerGen, have engaged in at other nuclear plants they have purchased. I think the NRC should fully investigate these charges before any license transfer is permitted so that persons like myself living near Vermont Yankee will know that they will not be endangered by work practices that cut corners on safety for profit. For this reason, I would like some assurance, which the NRC could provide by making this a condition for license transfer, that persons at Vermont Yankee with experience will not loose their jobs, and

that the new owner will not be allowed to fire a lot of experienced people and replace them with contract labor.

12. Finally, I am also concerned about the way in which AmerGen's intention to buy up 100 nuclear reactors could affect my health and safety. Unless the NRC looks into the potential affects of such a plan upon energy dependence in this area, we could end up stuck for the next 12 years with a company that controls most of the electricity available to us. This could mean high prices, unsafe conditions at Vermont Yankee in order to keep up profits to support other AmerGen operations, and other practices that would cut costs on site--all of which is dangerous to persons living near Vermont Yankee as I do. In my mind, the NRC is supposed to look at the national security and health and safety implications of any actions which could reasonably affect the ability of its licensees to safely operate their nuclear plants.

13. For the reasons I stated above, I believe the license transfer in this case should be open to dealing with the health and safety issues CAN is raising. I hope that the NRC will permit these issues to be discussed so that I and persons like me living near Vermont Yankee may be assured any new owner will operate it as safely as possible.

I declare under penalty of perjury that the foregoing is true and correct.

DATED: at Putney, Vermont this 18th day of February, 2000.

Anne Britton

Anne Britton
29 Retting Place
Brattleboro, VT 05301
(802) 257-2415

STATE OF VERMONT
COUNTY OF WINDHAM,ss:

On this 18th day of February, 2000, the above signed Anne Britton appeared before me and affirmed that the above Declaration is true and correct and that she signed it as her free act and deed.

Before me: Jonathan M. Block
Notary Public
My Commission Expires 2/10/2003

MA: Box 83 Shelburne Falls, MA 01370
P/F: 413-339-5781/8768
CT: 54 Old Turnpike Road, Haddam, CT 06438 P/F: 860-345-8431
VT: C/O Box 566 Putney, VT 05346 P/F: 802-387-4050
NH: 9 Evens Road, Madbury, NH 03820 P/F 603-742-4261
NY: 924 Burnet Ave. Syracuse. NY 13203 315-472-5478/ 7923

CITIZENS AWARENESS NETWORK

February 20, 2000

Office of the Secretary
Rulemaking and Adjudications Staff
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

RE: CAN's Request for Subpart M Hearing and Petition to Intervene in Hearing
In the matter of Vermont Yankee Nuclear Corporation
(Vermont Yankee Nuclear Power Station--*License Transfer*)
Docket no. 50-271

Dear Secretary:

Enclosed please find, for filing and service upon the Commission and Secretary, the original with attachments and five copies of the above referenced documents.

Thank you for your kind assistance.

Very Truly Yours,

Deborah B. Katz,
Executive Director, CAN

Enc./as described above

Before the
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of Vermont Yankee Nuclear Power Corp. Application for transfer of Part 50 license for Vermont Yankee Nuclear Power Station to AmerGen Vermont, LLC	Docket No. 50-271 Request to Commission for Subpart M Hearing and Petition for Same

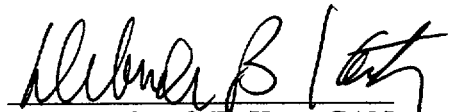
CERTIFICATE OF SERVICE

I, Deborah Katz, pro se for Citizens Awareness Network, Inc., certify that on this ___ day of February, 2000, I caused a copy of the above captioned filing to be sent to the United States Nuclear Regulatory Commission and the parties listed below by United Parcel, overnight service, pre-paid:

John Ritsher, Esq.
Ropes & Gray
One International Place,
Boston, Massachusetts, 02110

Kevin P. Gallen, Esq.
Morgan, Lewis & Bockius LLP
1800 M Street, NW.,
Washington, DC 20036-5869

General Counsel
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852



Deborah B. Katz, CAN
P.O. Box 3023
Charlemont, MA 01339-3023
(413)-339-5781

CONCLUSION

For the reasons set forth above, CAN requests a full, substantive hearing on the license transfer request at issue, and the granting of the Petition to Intervene in such a hearing.

DATED this 18th day of February, 2000.

Respectfully submitted:

Deborah B. Katz, *pro se* for CAN
P.O. Box 3023
Charlemont, MA 01339-3023
(413) 339-5781

cc: Office of Secretary;
Service List

Exhibit 1

Declaration of Anne Britton
(CAN member authorizing CAN to represent her interests in this matter and supporting standing)

Exhibit 2

Declaration of David Lochbaum
(Expert witness supporting CAN's contentions)
with his resume, Exhibit 'A', and UCS Report on Overtime and Staffing Problems in the Commerical Nuclear Power Industry, Exhibit'B' attached

Before the

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISISON

In the matter of **Vermont Yankee Nuclear Power Corp. Application for transfer of Part 50 license for Vermont Yankee Nuclear Power Station to AmerGen Vermont, LLC**	**Docket No. 50-271**

DECLARATION OF DAVID A. LOCHBAUM, NUCLEAR SAFETY ENGINEER, UNION OF CONCERNED SCIENTISTS, CONCERNING TECHNICAL ISSUES AND SAFETY MATTERS INVOLVED IN THE TRANSFER OF THE VERMONT YANKEE OPERATING LICENSE TO AMERGEN

I, David A. Lochbaum, make the following declaration:

1. My name is David A. Lochbaum. I reside in the state of Maryland.

2. I am employed by the Union of Concerned Scientists as their nuclear safety engineer. I have been so employed since October 1996. The Union of Concerned Scientists, with offices located at 1616 P Street NW Suite 310, Washington, DC 20036, is an independent nonprofit organization dedicated to advancing responsible public policies in areas where technology plays a critical role.

3. I have the following responsibilities at UCS: a) direct and coordinate nuclear safety program; b) monitor developments in nuclear industry to assess and respond to impact; c) serve as technical authority and spokesperson on nuclear issues; and d) initiate legal action to correct safety problems.

4. I have worked in the field of nuclear engineering since June 1979. I am a graduate of the University of Tennessee with a bachelor of science in nuclear engineering.

5. After receiving my nuclear engineering degree, I went to work for the Georgia Power Company as a junior engineer at their Edwin I. Hatch Nuclear Power Plant. I held various positions in the commercial nuclear power industry over the next 17 years prior to joining UCS. This experience is detailed in the resume attached hereto as Exhibit A.

6. I am the author of *Nuclear Waste Disposal Crisis* (Pennwell Books, Tulsa, January 1996) on the technical problems with spent fuel storage at reactor sites and numerous reports for UCS on nuclear safety issues.

7. At the request of Citizens Awareness Network, Inc., I have reviewed the proposed transfer of the operating license for the Vermont Yankee nuclear plant. I have also examined and am familiar with, for the purposes of preparing this declaration, the applicable federal regulations contained in Title 10 of the Code of Federal Regulations. I have relied upon these documents in formulating my opinions as expressed in this declaration.

8. Having examined the relevant documents as mentioned above, it is my professional opinion that the proposed license transfer raises significant safety concerns for persons working at Vermont Yankee and/or living within close proximity to the facility. It is also my professional opinion that these significant safety concerns have not been adequately considered. These concerns are set forth below along with my recommendation that the Commission should order that a substantive, rather than merely administrative, proceeding be conducted in this matter which considers the health and safety implications of the proposed license transfer at issue, and that a panel of the Atomic Safety and Licensing Board be instituted to conduct such a proceeding.

9. It is my professional opinion that the following significant safety issues would be created by the operating license transfer for persons living in close proximity to the Vermont Yankee plant and/or persons working there:

(a) The license transfer may increase the likelihood that workers at Vermont Yankee experience human performance degradation caused by fatigue. UCS issued a report on overtime and staffing issues last year (Exhibit B). Any new owner of the Vermont Yankee nuclear plant, particularly a limited liability company that lacks the financial wherewithal of a regulatory utility company, may be tempted to help recover the purchase costs by reducing the staff levels for the plant. The remaining staff members may be forced to work longer hours, thus increasing the potential for fatigue and fatigue-induced errors. Increased likelihood of worker errors directly corresponds to increased risk as documented in UCS's report. The NRC presently lacks regulations that protect the public from safety mistakes made by fatigued workers.

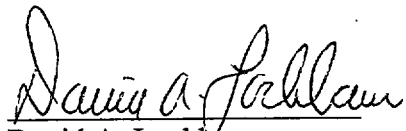
(b) The license transfer may increase the potential for people not being compensated for illnesses or property damage caused by radiation released from the Vermont Yankee site. During the period of the operating license, the public is guaranteed under the Price-Anderson Act of 1957 and its amendments for compensation. The Price-Anderson liability coverage ends when the operating license is terminated even though radioactive material could remain at the site in harmful amounts. The change in ownership may make it more difficult for any person suffering loss caused by the release of radioactivity from the Vermont Yankee site after license termination to receive compensation.

(c) The license transfer may increase the likelihood that the Vermont Yankee site is improperly decommissioned. The Maine Yankee nuclear plant is in the process of being decommissioned. Surveys of soil on the plant site of approximately 800 acres are being conducted primarily in locations where records show spills and run-offs have occurred. These sample locations are supplemented by the recollections of plant workers. The license transfer at Vermont Yankee may inhibit the identification of these survey locations, and thus reduce the likelihood that contaminated spots will be remediated, if all records are not transferred to the new owner and if the "corporate memory" is not retained.

10. It is my professional opinion that the safety concerns addressed in paragraph 9 could be created by the transfer of the Vermont Yankee operating license. I am also of the professional opinion, and do so state here, that the risk to persons working at the plant and/or living in close proximity to the facility could be increased by the proposed license transfer, and the risks and potential are real, not highly speculative, and should be taken very seriously.

I declare under penalty of perjury that the foregoing is true and correct.

Executed February 17, 2000



David A. Lochbaum
Union of Concerned Scientists
1616 P Street NW, Suite 310
Washington, DC 20036
(202) 332-0900
dlochbaum@ucsusa.org

Experience Summary

10/96 to date *Nuclear Safety Engineer, Union of Concerned Scientists*

Responsible for directing UCS's nuclear safety program, for monitoring developments in the nuclear industry, for serving as the organization's spokesperson on nuclear safety issues, and for initiating action to correct safety concerns.

11/87 to 09/96 *Senior Consultant, Enercon Services, Inc.*

Responsible for developing the conceptual design package for the alternate decay heat removal system, for closing out partially implemented modifications, reducing the backlog of engineering items, and providing training on design and licensing bases issues at the Perry Nuclear Power Plant.

Responsible for developing a topical report on the station blackout licensing bases for the Connecticut Yankee plant.

Responsible for vertical slice assessment of the spent fuel pit cooling system and for confirmation of licensing commitment implementation at the Salem Generating Station.

Responsible for developing the primary containment isolation devices design basis document, reviewing the emergency diesel generators design basis document, resolving design document open items, and updating design basis documents for the James A. FitzPatrick Nuclear Power Plant.

Responsible for the design review of balance of plant systems and generating engineering calculations to support the Power Uprate Program for the Susquehanna Steam Electric Station.

Responsible for developing the reactor engineer training program, revising reactor engineering technical and surveillance procedures and providing power manuevering recommendations at the Hope Creek Generating Station.

Responsible for supporting the lead BWR/6 Technical Specification Improvement Program and preparing licensing submittals for the Grand Gulf Nuclear Station.

03/87 to 08/87 *System Engineer, General Technical Services*

Responsible for reviewing the design of the condensate, feedwater and raw service systems for safe shutdown and restart capabilities for the Browns Ferry Nuclear Plant.

08/83 to 02/87 *Senior Engineer, Enercon Services, Inc.*

Responsible for performing startup and surveillance testing, developing core monitoring software, developing the reactor engineer training program, and supervising the reactor engineers and Shift Technical Advisors at the Grand Gulf Nuclear Station.

Experience Summary (continued)

10/81 to 08/83 *Reactor Engineer / Shift Technical Advisor, Tennessee Valley Authority*

Responsible for performing core management functions, administering the nuclear engineer training program, maintaining ASME Section XI program for the core spray and CRD systems, and covering STA shifts at the Browns Ferry Nuclear Plant.

06/81 to 10/81 *BWR Instructor, General Electric Company*

Responsible for developing administrative procedures for the Independent Safety Engineering Group (ISEG) at the Grand Gulf Nuclear Station.

01/80 to 06/81 *Reactor Engineer / Shift Technical Advisor, Tennessee Valley Authority*

Responsible for directing refueling floor activities, performing core management functions, maintaining ASME Section XI program for the RHR system, providing power manuevering recommendations and covering STA shifts at the Browns Ferry Nuclear Plant.

06/79 to 12/79 *Junior Engineer, Georgia Power Company*

Responsible for completing pre-operational testing of the radwaste solidification systems and developing design change packages for modifications to the liquid radwaste systems at the Edwin I. Hatch Nuclear Plant.

Education

June 1979 Bachelor of Science in Nuclear Engineering, The University of Tennessee at Knoxville

May 1980 Certification, Interim Shift Technical Advisor, TVA Browns Ferry Nuclear Plant

April 1982 Certification, Shift Technical Advisor, TVA Browns Ferry Nuclear Plant

Professional Affiliations

Member, American Nuclear Society (since 1978).

Exhibit B

Overtime and Staffing Problems In the Commercial Nuclear Power Industry

March 1999

My group spends a lot of time in the field, and so does the other groups and we see problems -- working hours, overtime, fatigue. There are three quick examples that we're in between having a standard on how to deal with that and a problem that we know is lurking out there.

NRC Staffer to Advisory Committee on Reactor Safeguards December 5, 1996

UNION OF
CONCERNED
SCIENTISTS

Washington Office: 1616 P Street NW Suite 310 • Washington DC 20036-1495 • 202-332-0900 • FAX: 202-332-0905
Cambridge Headquarters: Two Brattle Square • Cambridge MA 02238-9105 • 617-547-5552 • FAX: 617-864-9405
California Office: 2397 Shattuck Avenue Suite 203 • Berkeley CA 94704-1567 • 510-843-1872 • FAX: 510-843-3785

After the Three Mile Island accident, the Nuclear Regulatory Commission (NRC) recognized the role that worker fatigue could play in an accident. Unfortunately, that recognition did not lead to the problem's resolution.

An extensive review of NRC documents dealing with fatigue problems found a clear pattern of unenforceable ambiguity. The NRC's concern about worker performance problems caused by fatigue seems to be limited to their meekly encouraging plant owners to handle it. The NRC's inept treatment of this issue is baffling when compared to how successfully the agency dealt with another issue having similar impacts on worker performance – namely, substance abuse. For that issue, the NRC implemented a rule that has virtually eliminated substance abuse problems by nuclear workers.

Anecdotal evidence supports the conclusion of NRC ineffectiveness on the fatigue issue. Three members of the NRC's regional staff indicated that the agency feels that as long as nothing bad happens, it will take no action. That attitude, if reflective of NRC policy, would seem to be designed to – at best – prevent the *second* major reactor accident. It contradicts the NRC's mission, as defined by Congress, of providing adequate protection against the *next* major reactor accident.

The electric utility industry is undergoing restructuring. Nuclear power plant owners are cutting staffing levels in their efforts to generate electricity at competitive prices. As a result, workers at nuclear plants are working more overtime. For example, operators at a Midwest nuclear power plant logged 50,000 overtime hours in just one year's time – 1997. The worker fatigue problems are likely to get worse unless the NRC takes action to deal with the issues.

The full rationale for NRC's failure to meaningfully address overtime and staffing issues is not known, but a major part is simply "that nothing bad has happened yet." Using this unsound logic, the emergency core cooling systems and containment buildings at the nation's 103 nuclear power plants could be permanently removed since few events have required their use. Unlike the purported one in a hundred-thousand year or one in a million year chances of an accident requiring emergency core cooling systems and the containment building, worker fatigue is a minute by minute challenge to safe plant operation.

The NRC must establish clear requirements for working hours that reduce the potential for weary workers making grave mistakes.

How Workers Affect Nuclear Safety

According to information provided to the NRC by nuclear plant owners, 50 to 80 percent of serious safety problems involve worker errors.[1] The NRC's analytical staff reviewed reports submitted by plant owners and NRC inspectors and concluded that the sequence of events leading to a major plant accident would most likely be initiated by a worker mistake.[2] Following its review of plant-specific safety assessments, the NRC staff concluded, "human actions are clearly important contributors to operational safety" and "human error can be a significant contributor to [serious reactor accidents.]"[3] Thus, nuclear plant workers make mistakes and their mistakes can have very serious safety implications.

What causes nuclear plant workers to make mistakes? While there is no single cause for the mistakes, fatigue is responsible for some significant ones. For example, the NRC reported that in October 1990, three workers at Braidwood Unit 1 in Illinois, were sprayed with 180°F water – one individual received second degree burns – from the reactor coolant loop when plastic tubing used for testing burst open. Over 600 gallons of water drained from the reactor coolant system before the leak could be stopped. NRC inspectors concluded that fatigue from excessive overtime was a main contributor to this event.[4]

How Fatigue Affects Workers

Researchers have consistently found what Thomas Jefferson might have considered self-evident – that fatigue causes workers to make more mistakes and to perform less reliably.

The accident at Three Mile Island – the worst commercial nuclear plant accident in US history – occurred in the early morning hours of March 28, 1979. The following year, the NRC reported:

> Studies indicate that with fatigue, especially because of loss of sleep, an individuals detection of visual signals deteriorates markedly, the time it takes for a person to make a decision increases and more errors are made, and reading rates decrease. Other studies show that fatigue results in personnel ignoring some signals because they develop their own subjective standards as to what is important, and as they become more fatigued they ignore more signals.[5]

The last part is particularly disturbing because it suggests that well-founded procedures and layers of emergency equipment can be defeated by weary workers discounting warning signs.

Concern about fatigued workers is not confined to the nuclear industry. Research in the aviation industry found that fatigue:

- slowed individuals' reaction time,
- impaired people's problem-solving ability,
- made people more likely to take short cuts,
- made people more willing to accept higher than normal levels of risk.[6]

Here again, is the disturbing finding that fatigue prompts otherwise responsible people to take shortcuts and high risks.

The aviation study concluded that fatigue made it harder for people to solve problems. In 1992, researchers at Canada's Defence

and Civil Institute for Environmental Medicine quantified this negative impact. They reported that after 18 hours awake, people's problem-solving ability declined by 30 percent.[7] Note that this degradation occurs after the time awake not just the time on the job.

Although fatigue was not shown to be a factor in the space shuttle *Challenger* explosion, the Rogers Report did find that worker fatigue had contributed to prior near-misses.[8] One specific example cited was the aborted launch of shuttle mission 61-C on January 6, 1986. Five minutes before the launch, workers misinterpreted a valve indication failure in the automatic fueling sequence. This caused the undetected loss of nine tons of the liquid oxygen fuel. A fortunate side effect of the loss was a drop in temperature to the shuttle main engines, but this degraded condition was noted only 31 seconds before the launch. The launch was aborted. The investigation found two significant points:

- Worker fatigue was one of the major factors of the error. The workers were 11 hours into their third consecutive 12 hour midnight shift when the error was made.
- Had the error not been discovered and the launch aborted in the final seconds of the countdown, it was seriously doubted that the shuttle would have reached orbit.

The Rogers investigation was very critical of the long hours worked by shuttle subcontractors because, in part, they regularly exceeded the recommended limits of an NRC report[9]. The ironic part is that NRC never implemented its own recommendations.

Worker fatigue has even tarnished the golden arches. In 1983, an Oregon jury awarded $400,000 to the driver of a car struck by a McDonalds employee who had worked three shifts within a 24-hour period. The jury determined that McDonalds failure to control working hours "unreasonably created a foreseeable risk of harm."[10]

The effects of fatigue on nuclear safety are best summarised in the NRC's own words:

> The safety of nuclear power plant operations and the assurance of general public health and safety depend on personnel performing their jobs at adequate levels. Research on extended working hours indicates that the performance of individuals will degrade without adequate rest after long periods of work. Fatigue can degrade an operator's ability to rapidly process complex information such as that presented by off normal plant conditions. In addition, fatigue may jeopardize the ability to respond in a timely fashion. Furthermore, performance errors are more likely to occur as a result of lapses in short-term memory. Because individuals performing safety-related duties may be required to respond quickly to a plant emergency, it is important for plant management to carefully exercise control over overtime practices in order to ensure that plant personnel perform adequately.[11]

McDonalds was held accountable because it failed to properly deal with a foreseeable risk of harm. The NRC acknowledges that worker fatigue represents a risk to nuclear plant safety. What have they done about it?

What NRC Did About Fatigue

The NRC first attempted to deal with the fatigue problem with a policy statement on overtime issued in 1980.[12] The policy contained more restrictive working hour limits than currently exist, but even these 'limits' were diluted because they were presented as recommendations rather than as requirements. The policy also outlined the licensee's responsibility to "provide a sufficient number of trained personnel who are in the proper physical condition to operate and maintain the plant."

In 1982, the NRC sent all nuclear power plant owners information which forms the agency's current overtime policy. The major points of the policy are:

- Plant owners must have written procedures that formalize the working hour guidelines and prevent situations where fatigue could reduce the ability of operating personnel to keep the nuclear plant in a safe condition. The procedural controls should assure that personnel are not in a fatigued condition while at work that could significantly reduce their mental alertness or their decision-making ability.
- A sufficiently large work force should be used to prevent routine heavy use of overtime. The objective is a normal 8-hour day, 40-hour week while the plant is operating. If unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown, the following guidelines shall be followed:
  1. An individual should not work more than 16 hours straight.
  2. An individual should not work more than 16 hours in any 24-hour period, nor more than 24 hours in any 48-hour period, nor more than 72 hours in any seven-day period.
  3. A break of at least 8 hours should be allowed between work periods.
  4. Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on shift.
- If very unusual circumstances arise that require deviation from the guidelines, such deviation shall be authorized by the plant manager, his deputy, or higher levels of management.

After the Three Mile Island accident, the NRC required nuclear power plant owners to revise their operating licenses to include administrative controls on staffing levels and working hours. Although the administrative controls language was somewhat ambiguous, its placement in plant operating licenses meant that the NRC focused at least some attention to the matter.

Beginning in 1996, NRC undermined what little rigor remained in overtime regulation by allowing plant owners to re-revise their operating licenses, this time to *remove* the administrative controls on staffing levels and working hours. For example, the NRC issued a Safety Evaluation Report for San Onofre Units 2 and 3 to allow the overtime controls to be removed from Tech Specs. The basis was "that few events at U.S. nuclear plants have been attributed to inadequate control of working hours."[13]

How NRC Handled Substance Abuse

Ten years ago, the NRC issued the Fitness for Duty rule to address substance abuse in the nuclear power industry. The NRC imposed this rule because "scientific evidence is conclusive that significant decrements in cognitive and physical task

performance results from drug and alcohol usage."[14]

During 1997, researchers at the University of Southern Australia compared the effects from fatigue to those from alcohol consumption.[15] They used standard eye-hand coordination test methods. After 17 hours awake, the decline in performance was equivalent to a blood alcohol content (BAC) of 0.05 percent (the legal limit set by the NRC for access to nuclear power plants is a BAC of 0.04 percent). At 24 hours awake, performance had decreased to a level corresponding to a BAC of 0.10 percent.

Curiously, although conclusive scientific evidence shows that fatigue causes measurable drops in cognitive and physical task performance and the NRC's own records are replete with examples of safety problems caused by weary workers, the agency views fatigue with in an entirely different light from substance abuse.

During the public comment period for the fitness for duty rulemaking, one person observed that fatigue could impair worker performance. Another commenter noted that workers could be disciplined or fired for errors due to fatigue.

The NRC responded to these comments by acknowledging that fatigue was an important issue but claimed that sound management practices could be expected to be more effective than prescriptive regulations. Because it is more economical to get more work out of existing staff than to hire additional workers, the NRC's logic is wrong. The agency also did not explain why sound management practices would be inadequate to handle substance abuse. The NRC also took credit for the part of the rule that requires plant owners to ensure that workers are not impaired from any cause, arguing that fatigue was covered by this language. Given that this wording is even more nebulous than the NRC's guidance on overtime, the logic is fallacious. The NRC's guidance to inspectors when auditing fitness for duty programs at nuclear power plants makes no – zero – mention of fatigue and focuses solely on substance abuse.[16]

How effective is the fitness for duty rule? With respect to substance abuse at nuclear power plants, it has been very effective. Fewer than one percent of the 296,625 drug and alcohol tests administered to nuclear plant workers during 1996 and 1997 yielded positive results.[17] The rule has been less effective with respect to fatigue at nuclear power plants.

Conclusions

Independent studies and nuclear industry experience both show that fatigue degrades the performance of workers. The NRC reports that worker mistakes can lead to serious nuclear plant accidents. The NRC attempted to limit fatigue among nuclear plant workers through restrictions on overtime and staffing levels, but these efforts have been ineffective.

The NRC's ineffectiveness in handling the fatigue problem is hard to understand given the agency's success in addressing substance abuse problems. The NRC implemented a fitness for duty rule more than ten years ago that has effectively reduced substance abuse problems among nuclear plant workers. The NRC has been unable, or unwilling, to effectively address the fatigue issue.

The explanation for NRC's failure to address fatigue problems levels is not known. It may simply be that the agency

feels "that nothing bad has happened yet" as if its mission were to protect the public from the *second* major reactor accident. Using this logic, the emergency core cooling systems and the containment buildings at nuclear power plants could be permanently removed since few events, *so far*, have required their use.

The restructuring of the electric utility industry makes proper control of worker fatigue more important. Nuclear power plant owners are cutting staff sizes as part of their efforts to generate electricity at competitive prices. As a result, the remaining workers are putting in longer and longer days as they pick up the load from those who have left. Fatigue problems in the nuclear power industry must be resolved soon.

Unlike the purported one in a hundred-thousand year or one in a million year chances of an accident requiring emergency core cooling systems and the containment building, worker fatigue is a minute by minute challenge to safe operation. Actions are said to speak louder than words, but in this case, the NRC's inaction speaks the loudest.

Recommendations

The NRC must take actions to address worker fatigue at nuclear power plants. The NRC could either apply its fitness for duty rule or implement a comparable rule. In any case, the NRC must establish clear requirements for working hours that reduce the potential for weary workers making grave mistakes.

Nuclear power plant owners must develop and consistently implement administrative controls to protect their workers from conditions causing fatigue. The NRC's working hour limits must <u>not</u> be routinely abused.

[1] Nuclear Regulatory Commission, Transcript of 452nd Meeting of the Advisory Committee on Reactor Safeguards (ACRS), April 30, 1998.
[2] Nuclear Regulatory Commission, Information Notice No. 92-36, "Intersystem LOCA Outside Containment," May 7, 1992.
[3] Nuclear Regulatory Commission, NUREG-1560 Vol. 1, Part 1, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," October 1996.
[4] Nuclear Regulatory Commission, Information Notice No. 91-36, "Nuclear Plant Staff Working House," June 10, 1991.
[5] Nuclear Regulatory Commission, Circular No. 80-02, "Nuclear Plant Staff Working Hours," February 1, 1980.
[6] Remi, Joly, Transport Canada, "A Study of the Impact of Shiftwork and Overtime on Air Traffic Controllers: Phase I," TP 12257E. October 31, 1994..
[7] Angus, R.G., Pigeau, R.A., and Heselgrave, R., "Human Performance and sleep research: from the field to the laboratory," in C. Stampi (ed) *Why We Nap*. Boston: Birkhauser, 1992, pp 217-241.
[8] "Report of the Presidential Commission on the Space Shuttle *Challenger* Accident, Vol. II, Appendix G, June 1986.
[9] Nuclear Regulatory Commission, "Recommendations for NRC Policy on Shift Scheduling and Overtime at Nuclear Power Plants," NUREG/CR-4285 (PNL-5435), July 1985.
[10] Ed Coburn, "Managing the Costs of Worker Fatigue," *Risk Management News*, July 29, 1996, pp. 3-4.
[11] Nuclear Regulatory Commission, Information Notice No. 91-36, "Nuclear Plant Staff Working Hours," June 10, 1991.
[12] Nuclear Regulatory Commission, Circular No. 80-02, "Nuclear Plant Staff Working Hours," February 1, 1980.
[13] Nuclear Regulatory Commission, Safety Evaluation Report, "Issuance of Amendment for San Onofre Nuclear Generating Station," February 9, 1996.
[14] Title 10 Code of Federal Regulations, Part 26
[15] *Nature*, Vol. 388, 17 July 1997, pg 235
[16] Nuclear Regulatory Commission, Inspection Manual, Inspection Procedure 81502, "Fitness for Duty Program"
[17] Nuclear Regulatory Commission, Information Notice No. 98-39, "Summary Of Fitness-For-Duty Program Performance Reports For Calendar Years 1996 And 1997," October 30, 1998.

Before the
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of Vermont Yankee Nuclear Power Corp. Application for transfer of Part 50 license for Vermont Yankee Nuclear Power Station to AmerGen Vermont, LLC	Docket No. 50-271 Request to Commission for Subpart M Hearing and Petition for Same

CERTIFICATE OF SERVICE

We, Frederick Katz, President, and Deborah Katz, Executive Director, acting for Citizens Awareness Network, Inc., *pro se*, certify that on this 22d day of February, 2000, we caused a copy of the above captioned filing to be sent to the United States Nuclear Regulatory Commission and the parties listed below by United Parcel, overnight service, pre-paid, guaranteed AM delivery:

John Ritsher, Esq.
Ropes & Gray
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CITIZENS AWARENESS NETWORK, INC.

BY: _____
Frederick Katz, President

BY: _____
Deborah B. Katz, Executive Dir.

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Index of Copyrighted Exhibits in CAN's Petition to intervene in the Vermont Nuclear Power Station License Transferal

Exhibit 3 Associated Press, *Facts About The Companies* (June 25, 1999)

Exhibit 4 Dave, *Decommissioning Trust Funds Lure Potential Nuclear Plant Buyers,* 40 NUCLEONICS WEEK (Mar. 18, 1999)

Exhibit 5 Herbert, Josef, *Nuclear Plants Sell At Bargain Basement Prices*, JOURNAL OF COMMERCE (Mar. 17, 1999)

Exhibit 6 Salpukas, Agis, *A Small Circle of Companies Seeks Control of Reactors*, NEW YORK TIMES (March 6, 1999).

Exhibit 7 Hencke, David, Nuclear Industry's Plea For Secrecy THE GUARDIAN (July 8, 1999)

Exhibit 8 Smith, Rebecca, *Power Industry Changing in the Face of Deregulation*, THE WALL STREET JOURNAL (October 28, 1999).

Exhibit 10 Stellfox, David Decommissioning Fund Tax Treatment Could Break Plants Sales Deals, NUCLEONICS WEEK, (January 28, 1999)

Exhibit 12 Airozo, Dave, Decommissioning Trust Funds Lure Potential Nuclear Plant Buyers, 40 NUCLEONICS WEEK (March 18, 1999).

Exhibit 13 *Changing the Structure: PECO, Brits Create AmerGen, Go Fishing for US Nukes*, ELECTRICITY JOURNAL (November 1997).

Exhibit 14 Foster Electric Report (No. 165), *GAO Report Questions Adequacy of the Funding Mechanisms for Nuclear Plant Decommissioning* (May 19, 1999)

Exhibit 16 Moore, Kirk, *Radioactive Rods Could Pose Risk at Oyster Creek*, THE ASBURY PARK PRESS (November 5, 1998).

Exhibit 17 Associated Press, Both Would-Be Vermont Yankee Buyer *Cited Repeatedly* (Aug. 6, 1999).

Exhibit 18 Hudson, Nick, Six Year Change That Cost 45,000 Jobs, PRESS ASSOCIATION NEWS FILE (October 6, 1996)

Exhibit 19 Reguly, Eric, THE TIMES (October, 10, 1996).

Exhibit 20 Storm Sparks Major Nuclear Alert At Plant, Scotland DAILY RECORD (Dec. 30, 1998).

Exhibit 24 Lantau, Kelly, *Clinton Power Plant to Cut 200 Jobs by 2002*, THE PANTAGRAPH (Sept. 10, 1999)

Exhibit 28 *Safety Watchdog Orders British Energy to Halt Job Reductions*, THE INDEPENDENT (London, U.K.) (January 28, 2000).

Exhibit 34 Ryan, Margaret, *IP Paid To Get Rid of Clinton But Recouped in Stock Value*, 40 Nucleonics Week (November 18, 1999)

Exhibit 35 *Are AmerGen Partners Moving into Canadian Nukes*? 14 THE ELECTRICITY DAILY (January 4, 2000).

Exhibit 36 Shad, David, British Energy Eyes Canada Plant, THE SCOTSMAN PUBLICATIONS LTD. (December 20, 1999)

Exhibit 37 Salpukis, Agis, *PECO and UNICOM To Merge In Big Bet On Nuclear Power*, THE NEW YORK TIMES (September 24, 1999).

Exhibit 9

Internal Revenue Service Letter Rulings (July 21 1999).

DEPARTMENT: Administrative Rulings; IRS Letter Rulings

CITE: 1999 TNT 210-36

LENGTH: 2899 words

HEADLINE: 1999 TNT 210-36 QUALIFIED NUCLEAR DECOMMISSIONING FUNDS WON'T
RECOGNIZE GAIN. (Section 468A -- Nuclear Decommissioning Costs) (LTR 199943041) (Release Date: JULY 21, 1999) (Doc 1999-34921 (7 original pages))

CODE: Section 468A -- Nuclear Decommissioning Costs

ABSTRACT: The Service has ruled that neither a utility nor its qualified nuclear decommissioning funds will recognize gain or loss from the transfer of the funds to a buyer as the result of a sale.

SUMMARY: The Service has ruled that neither a utility nor its qualified nuclear decommissioning funds will recognize gain or loss from the transfer of funds to a buyer as the result of the utility's sale of a nuclear power plant. The Service also concluded that the utility will be allowed current ordinary deductions for any amounts it realizes as a result of the buyer's assumption of the decommissioning liability associated with the plant.

AUTHOR: Internal Revenue Service

GEOGRAPHIC: United States

INDEX: year of deduction, nuclear decommissioning costs

REFERENCES:
Subject Area:
Accounting periods and methods;
Corporate taxation

TEXT:

Release Date: JULY 21, 1999

Index Numbers: 468A.00-00, 461.00-00

Date: July 21, 1999

Dear * * *

[1] This letter responds to your request, dated January 14, 1999, that we rule on certain tax consequences of the sale of the Plant from Seller to Buyer. As set forth below, you have requested rulings regarding the tax consequences of the sale under section 468A of the Internal Revenue Code to the Seller and its Subsidiaries and their qualified nuclear decommissioning funds. In addition, you have requested whether the Seller and its Subsidiaries would be entitled to a deduction for amounts realized by them as a result of the Buyer's assumption of the decommissioning liabilities associated with the Plant.

[2] The Taxpayer has represented the following facts and information relating to the ruling request:

[3] The Taxpayer is the parent holding company of Subsidiaries 1, 2, and 3. The consolidated federal tax return is under the audit jurisdiction of the District Director of District 1. Each Subsidiary is a regulated public utility engaged in the generation, transmission, distribution and sale of electricity and uses the accrual method of accounting.

[4] The wholesale rates of the Subsidiaries are under the jurisdiction of Commission 3. The retail rates of Subsidiaries 1 and 2 are under the jurisdiction of Commission 2. The retail rates of Subsidiary 3 is under the jurisdiction of Commission 1. Subsidiary 1 owns a percent of the Plant, while Subsidiaries 2 and 3 each own b percent of the Plant. Each Subsidiary maintains both a qualified nuclear decommissioning fund and a non-qualified fund with respect to its interest in the Plant.

[5] The Buyer is a limited liability company whose two members are Partner 1 and Partner 2. The Buyer is under the audit jurisdiction of the District Director of District 2.

[6] Historically, the Taxpayer and its subsidiaries have conducted their electric utility business in a regulated monopoly environment. As a result of legislation enacted in State A and expected to be enacted in State B, the sale of electric generation in those states will become deregulated. In State A, Subsidiaries 1 and 2 will be permitted to recover stranded costs associated with their generation assets, including nuclear decommissioning costs, through a competitive transmission charge which will be a separate component of their bills to retail customers. Similarly, in State B, Subsidiary 3 will be able to recover stranded costs through a nonby passable transmission charge.

[7] In response to this changing environment, the Taxpayer made a decision to exit the generation business to focus solely on transmission and distribution. As part of this decision, the Taxpayer and Buyer entered into an agreement on c providing for the sale of the Subsidiaries' interests in the Plant to the Buyer.

[8] The Taxpayer and its subsidiaries will transfer the Plant and its related assets, nuclear fuel, plant license, and all of the assets of the Subsidiaries' qualified and nonqualified nuclear decommissioning funds to the Buyer. In exchange, the Buyer will transfer to the Taxpayer d and will assume the decommissioning liabilities associated with the Plant. The purchase agreement requires the qualified and nonqualified funds to have a combined total of e as of the date of closing.

Requested Ruling #11.

[9] The Subsidiaries' qualified nuclear decommissioning funds will not recognize any gain or otherwise take into account any income for federal income tax purposes by reason of the transfer of the assets of the qualified fund to a qualified fund established by the Buyer to receive such assets.

[10] Section 468A(a) provides that a taxpayer may elect to deduct payments made to a nuclear decommissioning reserve fund (the qualified fund). Section 468A(b) limits the annual deduction of the electing taxpayer to the lesser of the ruling amount or the amount of decommissioning costs included in the electing taxpayer's cost of service for ratemaking purposes for the taxable year.

[11] Section 468A(d) provides that the ruling amount means the amount determined by the Service to be necessary to (A) fund that portion of the nuclear decommissioning cost with respect to the nuclear power plant that bears the same ratio to the total nuclear decommissioning costs with respect to such nuclear power plant as the period for which the fund is in effect bears to the estimated useful life of the nuclear power plant, and (B) prevent any excessive funding of such costs or the funding of such costs at a rate more rapid than level funding.

[12] Section 468A(e)(2) provides that the rate of tax on the income of a qualified fund is 20 percent. Section 468A(4) provides, in pertinent part, that the assets in a qualified fund shall be used exclusively for satisfying the liability of any taxpayer contributing to the qualified fund.

[13] Section 1.468A-1(b)(1) of the Federal Income Tax Regulations provides that an eligible taxpayer is a taxpayer that possesses a qualifying interest in a nuclear power plant. Section 1.468A-1(b)(2) provides that a qualifying interest is a direct ownership interest or a leasehold interest meeting certain additional requirements. Section 1.468A-1(b)(4) provides, in part, that a nuclear power plant is any nuclear power reactor that is used predominantly in the trade or business of the furnishing or sale of electric energy, if the rates for such furnishing or sale, have been established or approved by a public utility commission.

[14] Section 1.468A-5(a) sets out the qualification requirements for nuclear decommissioning funds. It provides, in part, that a qualified fund must be established and maintained pursuant to an arrangement that qualifies as a trust under state law. An electing taxpayer can establish and maintain only one qualified fund for each nuclear power plant. Section 1.468A-5(c)(1)(i) provides that if, at any time during the taxable year, a nuclear decommissioning fund does not satisfy the requirements of section 1.468A-5(a) the Service may disqualify all or a portion of the fund as of the date that the fund does not satisfy the requirements. Section 1.468A-5(c)(3) provides that if a qualified fund is disqualified the fair market value (with certain adjustments) of the assets in the fund is deemed to be distributed to the electing taxpayer and included in that taxpayers gross income for the taxable year.

[15] Section 1.468A-6 generally provides rules for the transfer of an interest in a nuclear power plant (and transfer of the qualified fund) where after the transfer the transferee is an eligible taxpayer. Under section 1.468A-6(g), the Service may treat any

disposition of an interest in a nuclear power plant occurring after December 27, 1994, as satisfying the requirements of the regulations if the Service determines that such treatment is necessary or appropriate to carry out the purposes of section 468A.

[16] Thus, the applicable provisions of the Code and regulations set forth three general requirements for the establishment and maintenance of qualified funds. In order to establish and/or maintain a qualified nuclear decommissioning fund a taxpayer must be a regulated public utility (have cost of service ratemaking on a rate of return basis); have a qualifying ownership interest in a nuclear power plant; and, be liable for the decommissioning of the nuclear power plant.

[17] Under the specific facts herein, the Service will exercise its discretion to treat this sale, under section 1.468A-6(g), as a disposition qualifying under the general provisions of section 1.468A-6. This exercise of discretion is specifically based on the continued general supervision of the qualified fund by the Nuclear Regulatory Agency and the Federal Energy Regulatory Commission. In addition, this exercise of discretion applies to those provisions of section 1.468A-6 except those outlined in section 1.468A-6(e) with respect to the calculation of a schedule of ruling amounts subsequent to a sale. Thus, under section 1.468A-6 the Sellers fund will not be disqualified upon the sale when the fund withdrawal rights transfer to the Buyer.

[18] Section 1.468A-6(c)(1) provides that neither a seller of an interest in a nuclear power plant nor the seller's fund will recognize gain or loss or otherwise take any income or deduction into account by reason of a sale. Thus, because we are exercising our discretion not to disqualify the qualified funds, neither the qualified funds nor the Taxpayer and its Subsidiaries will recognize gain or loss or otherwise take any income or deduction into account upon the transfer of the qualified funds to the Buyer as a result of the sale.

Requested Ruling #2:

[19] The Taxpayer and its Subsidiaries will be allowed current ordinary deductions for federal income tax purposes for any amounts treated as realized by them, or otherwise recognized as income to them, as a result of the Buyer's assumption of the decommissioning liability associated with the Plant.

[20] Section 1.446-1(c)(1)(ii)(A) provides that under an accrual method of accounting, a liability is incurred and generally taken into account for federal income tax purposes in the year in which all the events have occurred that establish the fact of the liability, the amount of the liability can be determined with reasonable accuracy, and economic performance has occurred with respect to the liability.

[21] Section 461(h) makes clear that generally the all events test is not treated as having been met any earlier than the taxable year in which economic performance has occurred with respect to a liability. See also Treas. Reg. section 1.461-4(a)(1).

[22] Section 461(h)(2)(B) provides that in the case of a liability that requires the taxpayer to provide services, economic performance occurs as the taxpayer provides the services. Section 1.461-4(d)(4) provides that economic performance occurs with respect to such service liabilities as the taxpayer incurs costs in connection with the satisfaction of the liability.

[23] Under the general economic performance rules, the Taxpayer and its Subsidiaries would not be entitled to a deduction for their decommissioning liability until the year in which they incur costs to decommission the Plant. Section 1.461-4(d)(5), however, creates an exception to this general rule. It allows a seller of a trade or business, in certain limited circumstances, to deduct in the year of sale liabilities that otherwise would have been deducted but for the failure to meet the economic performance requirement. Specifically, that section provides in part as follows:

> If, in connection with the sale or exchange of a trade or business by a taxpayer, the purchaser expressly assumes a liability arising out of the trade or business that the taxpayer but for the economic performance requirement would have been entitled to incur as of the date of sale, economic performance with respect to that liability occurs as the amount of the liability is properly included in the amount realized on the transaction by the taxpayer.

[24] Under section 1.461-4(d)(5), the Taxpayer and its Subsidiaries are entitled to a deduction in the year of the sale for the decommissioning liability assumed by the Buyer if the all events test is otherwise satisfied and the amount of the assumed liability is properly included in the amount realized of the Taxpayer and its Subsidiaries.

[25] The first prong of the all events test requires that the fact of the liability be established at the time of the deduction. This prong of the all events test is satisfied in the instant case. Here, the Taxpayer and its Subsidiaries clearly have the obligation to decommission the Plant. The fact of the obligation arose many years ago, at the time they obtained a license to operate the Plant. See 10 C.F.R. section 50.33 and section 72.30, requiring the operator of a nuclear power plant to decommission it. Moreover, Congress recognized the existence of the decommissioning liability when, in 1984, it enacted section 461(h) and section 468A, noting that "[g]enerally, under Federal and State laws, utilities that operate nuclear power plants are obligated to decommission the plants at the end of their useful lives." H.R. Conf. Rep. No. 98-861, 877 (1984). See also S. Prt. No. 169, Vol. 1, 98th Cong., 2d Sess. 277 (1984).

[26] The second prong of the all events test requires the amount of the liability to be reasonably determinable. See Treas. Reg. section 1.461-1(a)(2)(ii). This prong is also satisfied. In the instant case, the amount of the Sellers' decommissioning liability has been determined by experts in the nuclear decommissioning industry. Their calculations have been reviewed and accepted by both the Nuclear Regulatory Commission (NRC), which is charged with ensuring that sufficient funds are available to decommission the Plant, and the Federal Energy Regulatory Commission (FERC), which is charged with ensuring that the ratepayers are not overcharged for their share of the decommissioning costs. In addition, there is also support in the Code for finding that the amount of the decommissioning liability is reasonably determinable at the time of sale. Section 468A(d) generally permits a current deduction for a "ruling amount," based on estimated future decommissioning expenses. To the extent the decommissioning costs are sufficiently determinable to entitle the utility to a deduction under section 468A, it is also reasonable to conclude that the costs must also be sufficiently determinable to satisfy the second prong of the all events test.

[27] Given that the two prongs of the all events test are satisfied, section 1.461-4(d)(5), will deem economic performance to be satisfied with respect to the decommissioning liability in the year of the sale to the extent the liability is included in the amount realized of the Taxpayer and its Subsidiaries. Thus, they will be entitled to a current deduction in such amount.

[28] Accordingly, to summarize the conclusions set forth above, we reach the following conclusions in response to the Taxpayers' requested rulings:

1. Neither the qualified funds nor the Taxpayer and its Subsidiaries will recognize gain or loss or otherwise take any income or deduction into account upon the transfer of the qualified funds to the Buyer as a result of the sale. This ruling is limited to the federal income tax effect of the transfer of the qualified fund to the Buyer. No ruling is made with respect to the gain or loss of the Taxpayer and its Subsidiaries on the sale of the plant and associated assets other then the qualified fund.

2. The Taxpayer and its Subsidiaries will be allowed current ordinary deductions for federal income tax purposes for any amounts treated as realized by them, or otherwise recognized as income to them, as a result of the Buyer's assumption of the decommissioning liability associated with the Plant.

[29] This letter ruling is directed only to the taxpayers that requested it. Section 6110(k)(3) provides that this ruling may not be used or cited as precedent.

[30] In accordance with the power of attorney, we are sending a copy of this ruling to your authorized representative. We are also send copies of this letter ruling to the District Director of the District 1.

Sincerely,

CHARLES B. RAMSEY
Chief, Branch 6
Office of the Assistant
Chief Counsel
Passthroughs and Special
Industries

Exhibit 11

Bishop, Todd, *PECO in Pickle Between A Nuke Buy and Taxes*, 18 PHILADELPHIA BUSINESS JOURNAL (July 30, 1999).

Subject: Peco in pickle between a nuke buy and taxes.
Date: Thu, 21 Oct 1999 17:43:38 -0400
From: Katie Flynn-Jambeck <kfjDV@helios.hampshire.edu>
To: can@shaysnet.com, katie@shaysnet.com

Mark

Philadelphia Business Journal, July 30, 1999 v18 i25 p3(2)

Peco in pickle between a nuke buy and taxes. (Peco Energy Co.) Todd Bishop.

A Peco Energy Co. venture's planned purchase of the Three Mile Island Unit 1 power plant has been complicated by the uncertain fate of the reactor's $320 million nuclear decommissioning fund.

AmerGen, the joint venture of the Philadelphia utility and British Energy, is lobbying Congress and the Internal Revenue Service in an attempt to resolve questions about the tax status of the fund upon the sale of the plant.

At stake are millions of dollars in potential taxes, a burden that not only complicates the Three Mile Island deal but would slow the industrywide pace of similar anticipated acquisitions and dampen deregulation efforts.

AmerGen is one of the first companies to grapple with the issue, and the resolution of this case could set a precedent.

"If you don't fix the tax rules, there are lots of these deals that aren't going to be made," predicted Ronald Clements, director of governmental relations for the Edison Electric Institute, the industry association for investor-owned utilities such as Peco. "It puts the companies in an impossible situation."

The fund in question was established by Three Mile Island owner GPU Nuclear Corp. and filled over time with ratepayer money to pay costs associated with the eventual closing of the plant, which is

additional 20 years

scheduled for 2014 but could be delayed an with proper approval.

transferred

Under existing laws, the fund would be taxed when along with the physical plant to the new owner.

the fund because the money company.

In addition, future contributions made by AmerGen to could lose their status as deductible expenses, would no longer be under the control of a regulated

conditions more deal. Peco and industry to support that would resolve country.

AmerGen has asked the IRS to establish tax favorable for the companies in the Three Mile Island GPU have also joined with others in the energy legislation pending in the U.S. House and Senate the problem for the sale of any nuclear plant in the

is the largest Island acquisition,

In the meantime, the companies said the tax question issue preventing the completion of the Three Mile which was originally scheduled to close in June.

determine how best to

Depending on the resolution, AmerGen and GPU could find themselves back at the negotiating table to distribute the unexpected liability.

spokesman Bill there would have to

"The deal is structured in a certain way," said Peco Jones. "If we got a particularly adverse ruling, be restructuring."

for ongoing electing or being onset of deregulation.

Observers said the issue carries broad implications changes in the power industry, with many utilities required to divest their nuclear plants with the AmerGen is seeking to own many of those plants.

policy for the in the law nuclear plant.

Richard Myers, director of business and economic Nuclear Energy Institute, said the proposed changes would lower the tax liability of the buyer of a

ago and did the industry.

The law in question was enacted mere than a decade net anticipate the major changes now taking place in

to reflect the

"The current tax law just simply needs to be updated new business realities," Myers said.

code. The

Other groups oppose the proposed changes in the tax Nuclear Information and Resource Service, a

Washington-based

watchdog group, issued a statement in early July

calling the push to

alter the law an unfair reward for the nuclear

industry.

made on two

Efforts to address the issue in Congress are being fronts. First, identical legislation has been

introduced in the House

and Senate that would resolve the tax question to

the benefit of the

companies involved in the nuclear deals.

bill would also

Separately, a provision in the House Republican tax address the issue, although Myers and other industry

observers said

the provision is not as comprehensive as the

separate bills.

that would

AmerGen, meanwhile, has asked the IRS for a ruling resolve the issue specifically for the Three Mile

Island transaction.

Jones of Peco said AmerGen appeared close to

receiving a decision

from the IRS.

Mile Island,

The joint venture's $100 million purchase of Three when complete, is expected to be the first sale of a

commercial

nuclear reactor in the nation.

Island Unit 2

The sale does not include the dormant Three Mile reactor, which in March 1979 was the site of the

country's worst

commercial nuclear accident.

including the Nuclear

The deal has received consent from agencies Regulatory Commission but awaits approval from the

New Jersey

Board of Public Utilities, which has been occupied

with the

deregulation of the state's electric and natural gas

industries.

some comprising

Three Mile Island is one of four nuclear facilities, more than one plant, that AmerGen is seeking to

acquire.

Others include the Nine Mile Point land 2 nuclear

plants, in Upstate New York. The company has agreed to buy controlling interests in the plants from the Niagara a Mohawk Power Corp. and New York State Electric & Gas in a deal valued at $163.2 million.

In its most recent deal, AmerGen in late June signed an agreement to purchase the Clinton Power Station from Illinois Power Co., which the company is required to divest as a condition of the merger of its parent, Illinova Corp., with Dynegy Inc., a natural gas company. Illinois Power said the sale of the Clinton plant will include the transfer to AmerGen of decommissioning funds expected to total about $95 million at the end of this year. The Clinton plant is to be decommissioned in 2026, the company said, when its operating license is scheduled to expire.

Exhibit 15

GAO *NRC's Decommissioning Procedures and Criteria Need to Be Strengthened,* GAO/RCED-89-119 (May 1989)

United States General Accounting Office

GAO

Report to the Chairman, Environment, Energy, and Natural Resources Subcommittee, Committee on Government Operations, House of Representatives

May 1989

NUCLEAR REGULATION

NRC's Decommissioning Procedures and Criteria Need to Be Strengthened

GAO/RCED-89-119

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Report to the Chairman, Environment, Energy, and Natural Resources Subcommittee, Committee on Government Operations, House of Representatives

May 1989

NUCLEAR REGULATION

NRC's Decommissioning Procedures and Criteria Need to Be Strengthened

GAO/RCED-89-119

Executive Summary

Purpose

Today, 112 nuclear power plants, 22 facilities that support these plants, 54 reactors used in research, and approximately 23,000 organizations hold licenses from either the Nuclear Regulatory Commission (NRC) or various states to use radioactive material. In addition, government agencies, such as the Department of Energy, have a multiplicity of facilities that use and dispose of such material. Eventually, most of these facilities will be decommissioned, which involves removing the radioactive material and terminating the license.

The Chairman, Environment, Energy, and Natural Resources Subcommittee, House Committee on Government Operations, asked GAO to determine NRC's procedures to ensure that licensees appropriately decommission their facilities. On July 29, 1988, GAO provided the Chairman with a report that discussed the adequacy of NRC's decommissioning cost estimates. Since only limited decommissioning actions have occurred at nuclear power plants, this report primarily discusses the actions that NRC has taken to ensure that fuel cycle facility licensees appropriately decommission their sites.

Background

NRC regulates the private uses of nuclear material. NRC requires that at the end of their useful lives, owners of nuclear facilities have to remove the radioactive material from the site, including land, groundwater, buildings and contents, and equipment. This is called decontamination. To terminate their licenses, the owners must eventually decommission the site by reducing residual (any remaining) radioactivity to a level that allows the property to be used for unrestricted use (any purpose). Once decontaminated, NRC can also release part of a facility for unrestricted use without terminating the license.

NRC is not the only federal agency involved in the decommissioning process. Since 1970, the Environmental Protection Agency (EPA) has been responsible for developing residual radiation standards. EPA expects to complete this effort by 1992. In the interim, NRC uses guidelines developed in the early 1970s to ensure that residual contamination will not endanger public health and safety. (See ch. 1.)

Results in Brief

NRC needs to ensure that licensees appropriately decontaminate their facilities. Under current regulations, NRC cannot specifically require additional cleanup once it terminates a license. On the basis of a review of eight fuel cycle licensees, GAO found that NRC fully or partially released two sites for unrestricted use where contamination at 1 was up-

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exist today. Also, NRC's regulations do not specify how long either the agency or the licensees should retain information.

Further, where data existed, GAO found that some licensees had not initially decontaminated their facilities to meet NRC's guidelines. In one case, NRC had to go back and conduct at least four additional inspections prior to releasing two buildings from the license. The release was made only after the licensee conducted extensive decontamination activities that included removing interior walls, concrete floors, and part of a roof and building. Further, NRC requires licensees to decontaminate facilities below NRC's guidelines if cost-beneficial to do so. Eleven of 19 decommissioning plans did not show that the licensees would meet this requirement. (See ch. 2.)

Monitoring of Buried Waste Should Be Improved

For almost 25 years, NRC allowed licensees to bury radioactive waste on-site without prior NRC approval. NRC required the licensees to retain records on the amounts and substances buried rather than provide them to NRC. In five of the eight cases GAO reviewed, licensees buried waste on-site, but four licensees either did not keep disposal data or the data are incomplete. In one case, NRC terminated a license and 10 years later learned that radioactive material had been buried on the site. Also, NRC generally does not require licensees to monitor for groundwater or soil contamination from buried waste. All five licensees have found groundwater contaminated with radioactive substances. At four sites, some of the contamination appears to have resulted from the buried waste—the contamination at one site was 400 times higher than EPA's drinking water standards allow. At another site, the contamination was 730 times higher, but the source was not known. (See ch. 4.)

NRC Lacks Regulations to Require Cleanup After Terminating a License

If NRC terminates a license and subsequent events show that contamination is higher than NRC's guidelines allow, NRC staff believe they can require the former licensee to conduct additional cleanup activities to protect public health and safety. However, NRC's regulations do not address the actions that NRC can take. Since (1) NRC has found contamination in excess of its guidelines after terminating a license, (2) complete information does not exist for all licensed activities or buried waste, and (3) NRC's regulations do not contain a time requirement for document retention, NRC needs to ensure that an appropriate basis exists to support a license termination decision. According to NRC staff, they expect to propose regulations to implement their authority in this area but could not estimate when they would do so. (See ch. 4.)

exist today. Also, NRC's regulations do not specify how long either the agency or the licensees should retain information.

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Chapter 1

Introduction

The Atomic Energy Act of 1954, as amended, allowed and encouraged the development of peaceful uses of nuclear materials, including commercial nuclear power plants. Along with the development of nuclear power, a commercial infrastructure, including fuel cycle facilities, was developed to support the plants. Fuel cycle facilities include plants that convert uranium ore to a gas suitable for enrichment, fabricate the enriched uranium into fuel elements, and reprocess the spent or used reactor fuel to recover unused materials for refabrication into new fuel elements. As of April 1989, the Nuclear Regulatory Commission (NRC), the agency responsible for regulating private uses of nuclear materials, had licenses with 112 nuclear power plants; 22 facilities that support the industry; about 54 reactors used in research; and, along with states authorized by NRC to perform certain regulatory functions, approximately 23,000 organizations for industrial, medical, and educational purposes. Each of these activities will eventually have to be decommissioned; the manner and extent depend on the radiation hazards present.

Decommissioning Nuclear Facilities

At the end of their useful lives, the owners and/or operators of nuclear facilities, including the site, buildings and contents, and equipment, have to decontaminate the facilities by removing the radioactive material they contain. To terminate their NRC license, the owners must decommission the facilities by removing them safely from service and reducing the residual (remaining) radioactivity to a level that allows the property to be used for unrestricted use (any purpose). Once decontaminated, NRC can release part of a facility for unrestricted use without terminating the license.

Further, owners of commercial nuclear power plants do not have to take all decontamination actions immediately. NRC's regulations allow the owners to partially decontaminate the facilities and protect access to them. However, most of these facilities will probably be decommissioned within 60 years of the end of their useful lives. During that time, radioactive material with a short half-life[1] will decay to levels that will reduce worker exposures and the volume of waste generated.

Because of their size and the large inventory of radioactive materials, commercial nuclear power plants will pose unique decommissioning problems. However, no utility has decommissioned a large plant (about 1,000 megawatts), and NRC does not expect a utility to do so until after the year 2000. Because no facility exists to permanently dispose of the

[1]Time required for radioactive material to decay or decrease by 50 percent.

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Type/licensee/location	Type of material primarily processed	Status
Nuclear Fuel Services, Erwin, Tenn.	High- and low-enriched uranium/plutonium	Plutonium facility and some uranium buildings being decommissioned. Other processes ongoing.
Texas Instruments, Attleboro, Mass.	High-enriched uranium	Facility being decommissioned. Company plans to decommission entire site.
United Nuclear, Montville, Conn	High-enriched uranium	Operating
United Nuclear, Wood River Junction, R.I.	High-enriched uranium	Facilities being decommissioned. Company plans to decommission entire site.
Westinghouse, Columbia, S.C.	Low-enriched uranium	Operating
Plutonium fabrication plants.		
Babcock and Wilcox, Lynchburg, Va	Plutonium	Plutonium facilities decontaminated. Facility being used for reactor service instrumentation
Babcock and Wilcox, Parks Township, Pa	Plutonium	Plutonium facility being decontaminated. Other processes ongoing.
Battelle Columbus Division, Columbus, Ohio	Plutonium	Plutonium facility decommissioned. Company plans to decommission entire site.
Energy Systems Group (Rockwell), Canoga Park, Calif	Plutonium	Plutonium facility being decontaminated. Other activities ongoing
General Electric, Vallecitos, Calif.	Plutonium	Plutonium facility decommissioned. Other processes ongoing.
Cimarron Corp. (Kerr-McGee), Crescent, Okla.	Plutonium	Plutonium facility being decommissioned. Company plans to decommission entire site.
Westinghouse, Cheswick, Pa.	Plutonium	Plutonium facility decontaminated. Other activities ongoing.

Source: NRC Fuel Cycle Safety Branch, Office of Nuclear Material Safety and Safeguards

NRC's Organization for Regulating Nuclear Facilities

Under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, NRC regulates the possession and use of radioactive material and ensures that the public is protected from the hazards of the material. NRC regulations for commercial power plants and fuel cycle facilities are primarily set forth in 10 CFR Parts 20, 40, 50, and 70. To carry out its responsibilities, NRC sets standards and makes rules, conducts or contracts for technical reviews and studies, issues licenses, and conducts inspections. Within NRC, the Office of Nuclear Reactor Regulation regulates utilities with nuclear power plants; the Office of Nuclear Material Safety and Safeguards regulates fuel cycle operators.

Until recently, NRC did not have specific regulations for decommissioning nuclear facilities. On July 27, 1988, new regulations took effect that set out technical and financial criteria for decommissioning licensed nuclear facilities. The regulations addressed decommissioning planning,

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clean up the facilities, and (3) list the amounts of radioactive material that remain. Upon receiving the survey results, NRC reviews them and, in most cases, has used a contractor, primarily Oak Ridge Associated Universities (ORAU), to conduct a confirmatory survey to verify the survey results. In all cases, according to NRC staff, NRC evaluates both the licensee's and ORAU's results and draws appropriate conclusions.

To determine acceptable levels of contamination on building surfaces, NRC uses Regulatory Guide 1.86 (June 1974) for nuclear reactors and an unnumbered guide initially developed in April 1970 and revised in May 1973, November 1976, and August 1987 for fuel cycle facilities and other licensees (Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Materials[1]). In addition, since 1981 NRC has used a branch technical position to determine acceptable levels of uranium and thorium contamination that can remain in the soil on the sites. Prior to 1981, NRC set soil contamination limits on a case-by-case basis. NRC uses the technical position for fuel cycle plants; it specifies maximum concentrations of uranium and thorium that can remain after NRC terminates the license. However, some fuel cycle operators conducted activities using plutonium; the technical position does not address this or other types of radioactive contamination.

Under the technical position, licensees have four options concerning the clean up of contaminated soil. The options address different concentrations of material that can remain in the soil. Option 1, for instance, allows NRC to release a site for unrestricted use if soil contamination is between 10 and 35 picocuries[2] per gram (depending on the type of material). Option 4, on the other hand, allows for higher concentrations (200 to 3,000 picocuries per gram, depending on the type of material) that can remain. Under option 4, however, the title documents must state that the land (1) contains buried radioactive material and (2) cannot be used for residential or agricultural purposes.

NRC also uses a 1983 Standard Review Plan to terminate fuel cycle facility licenses. The Standard Review Plan provides guidance to staff responsible for reviewing applications for terminating licenses and

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To determine the decommissioning methods that fuel cycle facility operators use, we obtained a list of 22 licenses that NRC had with 13 companies as of June 1987. We reviewed 19 decommissioning plans (3 licensees did not submit these plans) and selected 8 licensees for detailed review (app. I summarizes the 8 cases). We selected two of the eight licensees because NRC had terminated at least one license at the site or released all the land and/or buildings for unrestricted use, five because they were in the process of conducting decommissioning activities and had some part of their facility released by NRC for unrestricted use, and one that recently started to decommission its facilities. For all eight cases, we reviewed the actions that the licensees took to comply with NRC's requirements and, where applicable, NRC's actions prior to terminating a license.

In addition, we visited three licensees—Cimarron Corporation, Westinghouse Corporation, and Nuclear Fuel Services--to tour the facilities, observe the operations conducted and radioactive waste disposal methods used, and discuss their ongoing decommissioning activities. We also met with ORAU officials to determine the activities they perform for NRC, the results of their analyses, and their views on the adequacy of licensees' decontamination activities. We also reviewed NRC's Standard Review Plan for terminating fuel cycle facility licenses and inspection reports of licensee decontamination efforts.

Because no utility has decommissioned a commercial nuclear power plant, we did not review in detail NRC's process for terminating these licenses. However, we did review decommissioning plans submitted by five utilities to determine the methods they plan to use. The plants included Humboldt Bay 3, California; Indian Point 1, New York; Peach Bottom 1, Pennsylvania; Vallecitos Boiling Water Reactor, California; and Fermi 1, Michigan. We selected these five because decommissioning plans were available.

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NRC Does Not Ensure the Cleanup of All Radioactive Material

In two of the eight cases that we reviewed, NRC fully or partially released sites for unrestricted use that had radioactive contamination higher than NRC's guidelines. In one case, the contamination ranged from about 3 to 320 times higher; in the other, from 1.5 to 4.4 times higher. We could not determine if additional contamination existed at these sites or if similar problems occurred in the remaining six cases because NRC either did not have information, such as the licensees' radiological surveys, or the information it did have was incomplete.

Further, because the long-term effects of exposure to low-levels of radiation are not well known, a need exists for licensees to make a reasonable effort to eliminate residual contamination. However, in the eight cases we reviewed, the licensees generally did not do so. NRC inspection reports and ORAU confirmatory surveys show numerous instances where NRC required licensees to conduct additional decontamination activities at their facilities. Because no large nuclear power plant has been decommissioned, we could not assess utilities' practices in this area. However, our review of decommissioning plans for five plants showed that the utilities did not discuss the methods to be used to eliminate residual contamination. Rather, they primarily concentrated on the safe on-site storage of the plant until the time the utility would start to decommission it.

NRC's Actions Resulted in the Government's Incurring Cleanup Costs

In July 1975, NRC terminated a license held by Gulf United Nuclear Corporation (GUNC) in New York.[1] Subsequently, radiation in excess of NRC's guidelines was found. As a result, the purchaser of the site—the National Park Service—has spent about $80,500 to clean up the site and may have to incur total costs of at least $388,000 before the site meets NRC's guidelines.

In 1958, GUNC received a license to fabricate and/or test uranium oxide, thorium, and plutonium fuels. The facility, located near Pawling, New York, included about 1,170 acres of land, about 9 buildings, and a 55-acre lake (Nuclear Lake). GUNC stopped all operations in 1972 and contracted with Atcor Incorporated to decontaminate and survey the site. Atcor, however, did not take adequate soil or any lake sediment samples as part of the survey. After receiving the survey results, NRC inspected the site and performed a confirmatory survey to verify that it could release the site for unrestricted use. NRC took building and soil samples

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Table 2.1: Comparison of NRC's Release Limits With Contamination Levels Found by ORAU

NRC guidelines[a]	Facilities or areas exceeding guidelines	Remarks
Surface contamination		
Plutonium-239 2,500/dpm/ 100 cm^2	Plutonium Building—radiation levels were almost four times higher	Contaminated floors in five rooms
Cesium-137, 1.0 mrad/hr	Plutonium Building—radiation levels were as much as 320 times higher	Floor area in two rooms
Cesium-137, 1.0 mrad/hr	Multiple Failure Building—radiation levels were almost three times higher	Two areas in one room
Soil concentration		
Plutonium-239, 2 dpm/g	Areas around Plutonium and Waste Disposal Buildings—radiation level at 1 area was 100 times higher	Twelve contaminated areas around the buildings

[a]NRC's guidelines in effect in 1975

As of December 1, 1988, no certainty existed that all the radioactive contamination had been removed from the site. According to ORAU's project manager responsible for surveying the site, ORAU took only a few measurements in each building, primarily at locations where previous surveys had shown elevated contamination levels. The official believes that additional contamination would have been found if ORAU had conducted a more in-depth survey. In its final report, ORAU identified several areas where cleanup is needed or further assessments are necessary to fully characterize conditions. According to the official, the National Park Service did not ask ORAU to do a more extensive survey.

ORAU's project manager said that he believed NRC should not have released the site for unrestricted use because subsequent surveys showed that much higher radioactivity existed than NRC allowed at the time the site was released. For example, although no formal criterion existed for soil contamination, the licensee agreed to limit plutonium contamination to two disintegrations[2] per minute per gram. ORAU found a few areas that were up to 100 times higher than the limit. The project manager said that information provided by the licensee's contractor (Atcor Inc.) was insufficient because no lake sediment samples had been taken, even though some radioactive process waste appeared to have been released into the lake. Over time, however, contamination can build

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even though the contamination exceeded its release guidelines. For example, NRC concluded that (1) its guidelines merely set a "target" value rather than an absolute value that must be achieved, (2) the contaminated soil would be covered with approximately 7 feet of dirt, essentially eliminating the exposure pathway, and (3) the average concentration of the contaminated soil was within NRC's guidelines.

Further, in 1984 NFS asked NRC to release additional land from its license. Again the land was on the Clinchfield property and the site of the old Banner Spring stream bed. NFS surveyed the property; NRC made a confirmatory survey. On July 24, 1987, NRC released the land even though some soil contamination was almost 3 times higher than NRC's guidelines. NRC did not require the cleanup of all the contaminated soil because the staff concluded that the contamination level was low and would not adversely affect public health and safety because the land was only used by the railroad.

Information Lacking to Determine if Other Problems Occurred

We could not determine whether the Pa:::ling and NFS cases demonstrated isolated instances of poor regulatory oversight by NRC or systemic problems with NRC's process to ensure that licensees appropriately decontaminate and decommission their sites. In the other cases that we reviewed, NRC has released buildings, land, and parts of buildings. However, NRC either did not have information, such as licensees' radiological surveys or NRC's confirmatory surveys, or the information it had was incomplete. The following four cases illustrate various deficiencies in NRC's practices to ensure that licensees appropriately decontaminate and/or decommission their facilities.

Westinghouse Electric Corporation, Cheswick, Pennsylvania

In 1959 Westinghouse received a license to make fuel for commercial nuclear power plants; NRC terminated the license on August 20, 1974. According to NRC staff, Westinghouse conducted fuel fabrication activities in three buildings (5B, 5D, and a laboratory in 5A). However, when NRC terminated the license, it neither specified the buildings nor land that was released. As a result, we had to rely on inspection reports, letters, or memoranda to identify the buildings that NRC may have released for unrestricted use when it terminated the license. For example, NRC referred to a June 1974 inspection report of a uranium fabrication facility where licensed activities were conducted. The inspection report does not state whether this facility was building 5B, 5D, some other building, or a combination of buildings. In addition, neither NRC nor Westinghouse

even though the contamination exceeded its release guidelines. For example, NRC concluded that (1) its guidelines merely set a "target" value rather than an absolute value that must be achieved, (2) the contaminated soil would be covered with approximately 7 feet of dirt, essentially eliminating the exposure pathway, and (3) the average concentration of the contaminated soil was within NRC's guidelines.

Further, in 1984 NFS asked NRC to release additional land from its license. Again the land was on the Clinchfield property and the site of the old Banner Spring stream bed. NFS surveyed the property; NRC made a confirmatory survey. On July 24, 1987, NRC released the land even though some soil contamination was almost 3 times higher than NRC's guidelines. NRC did not require the cleanup of all the contaminated soil because the staff concluded that the contamination level was low and would not adversely affect public health and safety because the land was only used by the railroad.

Information Lacking to Determine if Other Problems Occurred

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did not contain UNC's radiological surveys for three buildings (5E, 6E, and 18H). According to a UNC official, the company did not survey buildings 5E and 6E because they were used only for administrative and engineering activities and, monitoring conducted while the facility operated, showed that the contamination was well within NRC's guidelines. NRC staff confirmed this information. However, NRC's files did not contain any information concerning a radiological survey for building 18H. According to NRC staff, a company official told them that the building was used for administrative purposes; NRC did not verify this information. NRC did acknowledge that UNC should have surveyed the building to determine if contamination existed, and NRC should have some documentation supporting the findings.

In addition, UNC's survey report for nine buildings located at New Haven stated that the company had taken soil samples at five locations and water samples from on-site storm basins. However, the report did not provide the results of the samples but stated that the information would be provided to NRC later. NRC files did not have this information. According to NRC staff, they do not know if UNC took the samples or sent the results to NRC.

Gulf United Nuclear Corporation, Pawling, New York

In 1975, when NRC terminated its license with GUNC at Pawling, New York, it also released three buildings (19H, 41H, and 50H) located at New Haven, Connecticut, and facilities located in Eastview and White Plains, New York, that had been transferred to GUNC around 1974. For these locations, NRC had only one radiological survey that addressed two buildings (19H and 50H); building 41H and the Eastview and White Plains locations were not addressed. Further, the survey may not be complete because it only discussed parts of buildings 19H and 50H, not the entire buildings. NRC staff could not tell us if the licensee had surveyed the entire buildings and only reported on those areas that were contaminated or if the licensee merely surveyed portions of the buildings. In addition, NRC staff pointed out that regulatory responsibility for the Eastview site was transferred to the state of New York. An NRC staff member does remember that the licensee surveyed the Eastview site but could not recall the results or whether the state or NRC did a confirmatory survey before the license was terminated. For White Plains, NRC staff do not know when the facility was released, whether the licensee performed a survey, or whether NRC verified the results.

However, the concern over inadequate or incomplete NRC information is not new. For example, in 1976 we took a random sample of NRC files and

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being left in place. However, an April 1984 ORAU survey found some areas of surface and subsurface contamination that were between 7 and 68 times higher, respectively, than NRC's guidelines. The contamination was located primarily within the boundaries of a suspected burial site and in a few locations around one building. In addition, a sample from a groundwater monitoring well showed radioactive contamination that was six times higher than EPA's drinking water standards.[4] According to NRC officials, the buried materials have been stabilized and the matter is still being reviewed by NRC.

Further, prior to terminating its license, GE surveyed its San Jose, California, site and concluded that the contamination for buildings H and J was below NRC's limits; NRC's confirmatory surveys proved otherwise. Between August 1982 and September 1984, NRC surveyed the buildings at least five times. During four of the surveys, NRC identified locations where contamination exceeded its guidelines and required GE to conduct further decontamination activities. For example, in the J building, GE had to remove interior walls, concrete floors, drainage lines, and portions of the roof to reduce contamination. In addition, in the H building, NRC found some contamination that was eight times higher than its guidelines allowed. GE reduced the contamination by removing part of the building. Further, NRC collected 13 soil samples and found that 4 contained contamination ranging from 1 to 77 times higher than its guidelines. To bring the concentrations within NRC's guidelines, GE had to do further decontamination work. NRC's documents were silent, however, on the methods GE used to carry out its efforts.

Also, NRC directs licensees to decontaminate their facilities to levels lower than NRC's release guidelines if it is cost/beneficial to do so. If NRC later institutes more restrictive release criteria, the facilities may already meet them, and additional decontamination work would not be needed. Our review of 19 fuel cycle facility decommissioning plans showed, however, that 11 did not discuss the actions that licensees would take to reduce residual contamination below NRC's guidelines. The remaining eight plans stated that the licensees would make a reasonable effort, and three of the eight provided details on the actions to be taken. Further, our review of decommissioning plans for five nuclear power plants showed that the utilities expect to meet NRC's guidelines but do not plan to reduce contamination below the limits established.

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To estimate exposure, a number of factors must be considered. These include the type of radioactive material, length of exposure, and part of the body receiving the exposure. Although the effects of large radiation doses are well known, considerable controversy exists over the risks associated with long-term or continual exposure to small doses of radiation. As a result, different federal agencies use various criteria. For example, NRC uses 500 mrem/year as the maximum whole body dose that an off-site individual could receive; by contrast, EPA uses 25 mrem/year. In addition, other criteria exist for radiation doses to various organs, such as the lungs, gonads, and thyroid.

When commenting on NRC's 1988 decommissioning rule, many organizations pointed out that a need exists for the federal government to develop consistent residual radiation standards. For example, the Electric Power Research Institute stated that a great deal of uncertainty exists for a utility to determine levels of residual radioactivity that will be allowed when NRC releases a site for unrestricted use. In addition, some of those commenting suggested levels for NRC's consideration. The Public Citizen Environmental Action group, for example, wanted NRC to establish a maximum whole body dose of 10 millirems per year. Likewise, the preamble to NRC's decommissioning regulations states that many have expressed concerns about the lack of residual radiation limits and urged NRC to develop such levels as quickly as possible.

In addition, prior GAO reports have addressed the need for federal residual radiation criteria. In 1977, we pointed out that a decommissioning strategy could not be developed until NRC established acceptable residual radiation limits.[1] As a result, we recommended that NRC determine acceptable levels for residual radiation and surface contamination consistent with standards being developed by EPA. In 1982, we again pointed out that radiation standards are needed to guide decommissioning programs.[2]

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exceed 5 picocuries per gram and 15 picocuries per gram for 6 inches of soil below the first level.

NRC and EPA are not the only organizations concerned about residual radiation levels. In 1971 the Health Physics Society Standards Committee, working with ANSI, established a subcommittee to develop permissible levels of residual radioactivity on materials, equipment, and facilities. For 16 years, the subcommittee debated the appropriate residual radiation levels for more than 18 substances, met with government and industry representatives, and reviewed available documents on the long-term effects of radiation. In December 1986, the subcommittee approved residual radiation standards for surface contamination (ANSI N13.12); ANSI has not yet approved them. In January 1989, ANSI asked the subcommittee to analyze the effects of the proposed standards on exposures to the public. According to an ANSI official, the subcommittee is to complete its review by March 1991.

Some of the proposed standards are lower or higher than NRC's regulatory guides. For example, acceptable residual radiation levels for transuranics,[1] radium-226, radium-228, strontium-90, iodine-125, and iodine-129 range from 3 to 50 times higher than NRC's limits, while others, such as natural uranium, uranium-235, and uranium-238, are 3 to 5 times lower than NRC's limits. Overall, the largest change in the proposed standards would be a 50-fold increase in acceptable levels of iodine-125 and iodine-129.

According to NRC staff, they based Regulatory Guide 1.86 on ANSI standards that had been proposed in 1974. The health physics committee chairman responsible for developing the new standards told us that a number of factors have changed since then. For example, the committee now believes that uranium is more harmful than it did in 1974. The chairman agreed that NRC's guidance is based on proposed ANSI or Health Physics Society standards that never made it through the ANSI approval process because of their controversial nature. According to the chairman no guarantee exists that ANSI will approve the new standards, but he believes they represent achievable limits and are more appropriate than the limits NRC now uses for decommissioning nuclear facilities.

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Between 1957 and January 1981, NRC allowed all licensees to bury radioactive waste on-site without prior NRC approval (10 CFR 20.304). Five fuel cycle licensees disposed of waste in this manner. However, NRC imposed only minimal requirements for on-site burial and did not set concentration limits. Rather, the regulations provided that a licensee could bury waste if the

- total quantity of each burial did not exceed 1,000 times the amounts specified in the regulations for various radioactive material; for example, the limit on americium-241 and plutonium-239 was 0.01 microcurie;
- waste was buried 4 feet or more below the surface; and
- burials were at least 6 feet apart, and the number of burials did not exceed 12 in any year.

The regulations did not, however, require the licensees to provide burial records to NRC. As a result, NRC has limited information on the types and amounts of waste buried. Although the regulations required the licensees to retain this information, our review of NRC's files and information provided by NRC staff for five licensees shows that four either did not keep these data or they are incomplete. In one case, NRC terminated a license and 10 years later learned that the company had buried waste on the site. The following describes this case.

Westinghouse Electric Corporation

NRC terminated a license (SNM-338) with Westinghouse in 1974. In June 1984, a Westinghouse employee telephoned NRC stating that radioactive waste had been buried at the Cheswick, Pennsylvania, site. Westinghouse still operates the site under another NRC license and subsequently found three buried waste sites—one was underneath an employees' softball field. Although the company had no records showing the number of burials that occurred, types and amount of substances buried, or part of the process that generated the waste, officials believe the disposal in one area occurred in 1966. However, the officials do not know when the other burials took place.

Westinghouse excavated the waste and found (1) 55-gallon drums containing waste solutions, sludge, gloves, and building rubble in one area, (2) building rubble in another, and (3) plastic bottles, duct work material, and building rubble under the ballfield. According to NRC staff, they do not plan to take any enforcement action against the company because Westinghouse is taking corrective action by removing the waste and sending it to an NRC-licensed disposal site.

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Although NRC staff are generally not concerned that buried waste can migrate, evidence exists that buried waste can present environmental and/or health and safety problems. For example, a 1976 report by the Electric Power Research Institute stated that plutonium, because of its long half-life, must be regarded as a permanent contaminant, although it migrates very slowly. In addition, the coauthor of a 1980 report, Identification of Technical Problems Encountered in the Shallow Land Burial of Low-Level Radioactive Wastes, told us that the possibility for migration of radioactive wastes increases depending on soil composition and the amount of rainfall experienced. According to the report, water seeped into burial trenches at 6 of 11 commercial and government low-level waste sites, and the operators had to temporarily close 2 because of the problems found. Also, in August 1988 we reported that buried waste can (1) migrate into rivers and streams, (2) migrate into groundwater supplies, or (3) inadvertently be disturbed by people or animals.[1]

In addition, iodine-129 from defense production waste buried on DOE's Hanford Reservation in Washington State has migrated to the groundwater, and hazardous waste buried at DOE's Savannah River, South Carolina, plant has contaminated an aquifer underlying the site. Further, a study has shown that radioactive waste that also contains hazardous chemicals can migrate faster than radioactive waste alone. Some fuel cycle operations may have used hazardous chemicals, such as solvents and leachates. Five of the eight licensees we reviewed buried waste onsite; five have found groundwater contaminated with radioactive substances. Four of the cases are discussed below.

Nuclear Fuel Services, Inc.

NFS used three burial sites and three ponds to dispose of radioactive waste. Although the company had some records showing the types and amount of waste disposed, the records were not complete. For example, one burial site had two trenches, but NFS does not have information showing when it used the trenches, a description of items disposed, or the radioactive material or quantities in the waste. NFS subsequently removed much of the waste from the trenches, decontaminated it, and sold it to a local organization.

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Cimarron Corporation

Cimarron Corporation, owned by Kerr-McGee Nuclear Corporation, received a license around 1965 to fabricate uranium fuel and in 1970 to fabricate plutonium fuel. Cimarron used five settling ponds and a burial site to dispose of radioactive waste generated from its uranium/plutonium operations. The burial area included four trenches. In 1985 the company began to excavate, package, and ship the waste to an NRC-licensed disposal facility. As of January 1989, Cimarron had removed more than 6,400 drums of waste and plans to complete the removal process by 1991. Cimarron's environmental monitoring reports between 1985 and 1987 showed groundwater contamination from the burial area that was between 208 and 360 times higher than EPA's drinking water standards allow. In June 1988, NRC recommended that the company obtain additional information about the groundwater under the site. In August 1988, ORAU found groundwater contaminated from the buried waste to be as much as 400 times higher than EPA's drinking water standards allow.

Texas Instruments, Inc.

Until 1959, the Texas Instruments, Inc. (TI) facility, located about 30 miles south of Boston, Massachusetts, was owned and operated by Metals and Controls, Inc. In 1955 the company received a license to fabricate fuel for research reactors and in 1959 merged with TI, which continued these operations under the same license. The company stopped all licensed activities and in 1982 asked NRC to terminate the license. As of May 1989, NRC had not done so.

In January 1983, TI provided NRC with a radiological survey report to support its termination request. The report showed that waste had been buried on the site between 1958 and 1960 but that the radioactivity was below NRC's release limits. In December 1983, NRC requested ORAU to survey portions of the site. ORAU found isolated areas of soil contamination and groundwater contamination that was more than six times higher than EPA's drinking water standards allow.

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Conclusions and Recommendations

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Only very limited decommissioning activities have occurred at large commercial nuclear power plants because no disposal facility exists for the high-level waste generated from their operations. Instead, utilities expect to partially decontaminate the plants and place them in storage for several decades to allow the radioactive material to decay. However, the same is not true for fuel cycle facilities. Some operators of these facilities have fully decommissioned some or all of their sites or are now decommissioning them.

Although only one fuel cycle facility that we reviewed had been completely decommissioned, the activities that have occurred with others provide some perspective on the manner in which NRC carries out its regulatory responsibilities in this area. In this regard, we found a number of areas in which NRC can play a stronger role in ensuring that all land, buildings, and equipment that it releases for unrestrictive use meet the guidelines that it has established.

For example, NRC can provide only limited assurance that licensees have fully decontaminated their facilities and accurately reflected the results of these activities in their radiological surveys. NRC and ORAU confirmatory surveys show that in many instances, excessive radiation remained after the licensees' completed initial decontamination activities. In some cases, the contamination was hundreds of times higher than NRC allowed. In other cases, the licensees did not, as regulations require, make a reasonable effort to decontaminate their facilities below the levels that NRC's guidelines allowed.

In addition, NRC does not require licensees to keep decommissioning records after it terminates a license. Although NRC is required to keep such information for at least 10 years beyond the termination of the license, NRC either did not have such information or the records that it did have were incomplete or ambiguous. Since both the Pawling and Westinghouse cases illustrate that problems can occur many years after NRC terminates a license, NRC must ensure that it obtains and keeps information on licensees' decommissioning activities.

Also, no federal standards exist for acceptable levels of radioactivity that can remain after NRC releases a site for unrestricted use. The need for such standards was raised almost 20 years ago. To date, neither NRC nor EPA has resolved the issue. In the interim, NRC uses criteria developed in the early 1970s. Since that time, the Health Physics Society Standards Committee has concluded that some radioactive materials are more hazardous than experts believed 15 years ago. The lack of federal

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and specifics on land, buildings, and equipment that were contaminated over the life of the license.

In addition, since NRC believes that it has authority to require additional cleanup activities after terminating a license and to ensure that it has a mechanism to enforce orders requiring such activities, the Chairman, NRC, should act expeditiously to issue regulations governing such actions. In the interim, the Chairman should also ensure that all contamination at a site has been cleaned up so that it is below the levels that NRC's guidelines allow before releasing all or part of a site for unrestricted use.

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Information on Eight Fuel Cycle Facilities

Cimarron Corporation, Crescent, Oklahoma

The Cimarron Corporation facility, located on about 1,000 acres in central Oklahoma, is owned by the Kerr-McGee Nuclear Corporation. Cimarron received a license around 1965 to fabricate uranium fuel (SNM-928) and in April 1970 to fabricate plutonium fuel (SNM-1174). To dispose of the radioactive waste generated by these operations, Cimarron used five settling ponds (two unlined and three lined) and a small burial site (about 1 acre), and around 1979 built a sanitary lagoon over three of the settling ponds that had been used to dispose of radioactive waste. In the fall of 1975, Cimarron decided to terminate all operations at the site. Since that time, the company has decontaminated and NRC has released parts of the facility for unrestricted use. As of May 1989, NRC had not terminated the licenses.

NRC's files show that the company stopped using the five ponds in December 1975. The company allowed the liquid to evaporate, removed the remaining sludge and mixed it with cement, and sent it to an NRC-licensed waste disposal site. In addition, after removing the sludge, Cimarron analyzed the top 6 inches of soil in the ponds. In August 1977, the company provided NRC with a plan for releasing the five ponds by backfilling them with dirt. On July 10, 1978, NRC authorized Cimarron to take this action and released the ponds for unrestricted use.

According to NRC staff, they did not observe the licensee backfilling the ponds, and they had no criteria for the levels of radioactivity that could remain after the company decommissioned the ponds. In October 1981, NRC issued guidelines for decommissioning soil contaminated with uranium and thorium. Available documentation shows that radioactive contamination in 2 ponds ranged from 6 to 10 times higher than the guidelines allowed. Cimarron does not plan to take further actions on the ponds because NRC released them before issuing the guidelines, but company officials told us that they may include disposal information when they prepare a final decommissioning plan for the site.

In addition to the ponds, from 1966 to 1970, Cimarron buried radioactive waste that had been generated in the uranium facility. The burial area included at least four trenches. Although Cimarron disposal records showed the date, type of waste, and levels of radioactivity for each burial, they did not specify the trenches in which the waste was buried. In 1985 the company began to excavate, package, and ship the waste to an NRC-licensed disposal facility. As of January 1989, Cimarron had removed more than 6,400 drums of waste from four trenches and plans to complete the removal process by 1991. However, the company has not removed all contaminated soil in or around the trenches.

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Nevertheless, in 1974 the company began decontamination activities at the site. It has decontaminated two warehouse buildings and is decontaminating two liquid waste disposal ponds. It has also been assessing various disposal options for contaminated limestone rock that had been used to filter air emissions and had been used as backfill material at the site.

In the late 1950s and early 1960s both Mallinckrodt and United Nuclear buried small quantities of uranium waste within the licensed boundaries of the site. However, neither CE nor NRC have specific information on the size of the burial area, the number of trenches it contained, or the amount and types of substances disposed in them. In 1982 NRC contracted with Radiation Management Corporation to survey the buried waste site. In July 1983, NRC reported that (1) three types of uranium (uranium-234, uranium-235, and uranium-238), radium, and thorium waste had been buried, (2) soil samples showed uranium-234 contamination that was 40 times higher than NRC's guidelines allow, and (3) samples from two on-site groundwater-monitoring wells appeared to show that contamination from the burial grounds ranged from 1 to 12 times higher than EPA's drinking water standards allow. The report also concluded that all sites may not have been identified and/or surveyed because CE did not have complete information on the number or locations of burial sites.

In addition to buried waste, until 1978, CE used two settling ponds for handling radiological liquid wastes from its processing operations. The company allowed the liquid to evaporate and has been removing the remaining sludge and dirt from the ponds. CE plans to send the sludge and soil to an NRC-licensed disposal site. Once these activities are complete, the remaining contamination is expected to be between six and seven times higher than NRC's guidelines for releasing soil for unrestricted use. As a result, the company plans to cover the ponds with clean fill dirt to bring the contamination closer to NRC's guidelines for unrestricted release. However, NRC documents indicate that the two ponds and/or the burial grounds have contaminated the groundwater under the site. For example, samples taken in 1977 and 1978 from two on-site groundwater monitoring wells appear to show contamination from the ponds and/or burial grounds that was 96 times higher than EPA's drinking water standards allow.

In a related matter, in 1979 NRC authorized CE to use limestone rock chips to filter corrosive gases used in its process before releasing the gas to the atmosphere. NRC also allowed the company to use the stone as on-

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decontamination and reported its findings to NRC, and NRC should have retained the information.

Between August 1982 and September 1984, NRC surveyed building J or H at least five times. During four of the surveys, NRC identified locations where contamination exceeded its guidelines and required GE to conduct further decontamination. For example, in the J building, GE had to remove interior walls, concrete floors, drainage lines, and portions of the roof. In addition, NRC found some contamination in the H building that was eight times higher than its guidelines allowed. GE reduced the contamination by removing part of the building. Further, NRC collected 13 soil samples and found that 4 contained contamination ranging from 1 to 77 times higher than the guidelines allowed.

In addition to the San Jose location, GE's license covered activities performed off-site. Under NRC's guidelines, GE should have documented that remaining contamination, if any, was low enough for unrestricted use. However, NRC did not have documentation in its files showing whether (1) GE surveyed the off-site locations, (2) NRC inspected them and/or confirmed the survey results, or (3) the levels of contamination that remained when NRC transferred the license to the state were below NRC's release limits.

Gulf United Nuclear Corporation, Pawling, New York

In 1958 Gulf United Nuclear Corporation (GUNC) received a license to fabricate and/or test uranium oxide, thorium, and plutonium fuel in several small research reactors. The facility, located near Pawling, New York, included about 1,170 acres of land, about 9 buildings, and a 55-acre lake (Nuclear Lake). GUNC stopped all operations in 1972 and contracted with Atcor Incorporated to decontaminate and survey the site. After receiving the survey results, NRC inspected the site and performed a confirmatory survey to verify that it could release the site for unrestricted use. NRC took building and soil samples and found several areas that required further cleanup by the licensee. After GUNC notified NRC that the areas had been decontaminated, NRC terminated the license on July 14, 1975.

Subsequently, GUNC sold the site to Harpoon, Inc., which in June 1979 sold the property to the U.S. Department of the Interior's National Park Service for relocating part of the Appalachian National Scenic Trail. After the National Park Service acquired the property, it contracted with Nuclear Energy Services for radiological surveys of portions of the

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level radioactive waste, respectively. Between 1958 and 1968, NFS discharged liquid uranium and thorium waste to holding ponds, which, in turn, discharged the clarified solution to a small stream (Banner Spring) that flowed through the site. The stream also flowed through property owned by the Clinchfield Railroad. In 1968 NFS diverted the flow of Banner Spring.

In 1973 NFS stopped using the plutonium facilities and began to decommission them in the late 1970s. NFS later stopped these activities because no commercial disposal site was available for the transuranic waste resulting from the decommissioning activities. In 1986 DOE and NFS reached an agreement to send the waste to DOE's Idaho National Engineering Laboratory. As a result of the agreement, NFS resumed decommissioning activities on the plutonium facilities; the company expects to complete these activities by 1992.

In 1978 NFS initially prepared a plan for the future decommissioning of 18 buildings used to process high- and low-enriched uranium. According to the plan, the company expects to eventually remove about 310,000 cubic feet of contaminated material representing approximately 450 shipments to an NRC-licensed disposal site, probably Barnwell, South Carolina. The company has started to decommission three buildings and is deciding the most appropriate method to decommission three unlined ponds that had been used from 1958 until 1978 to dispose of liquid low-level waste from various plant operations. According to NRC's Executive Director for Operations, NFS has been working closely with NRC and the state and expects to provide a decommissioning plan for the ponds by July 1989.

To develop the decommissioning plan, NFS will use information from its monitoring program. In October 1983, NRC required NFS to take monthly samples from 14 groundwater monitoring wells to determine the radioactive and hazardous substances they contain. Sample results in 1987 showed radioactively contaminated groundwater in six wells at levels higher than EPA's drinking water standards allow. In one well the contamination was 730 times higher than these standards. Although the wells were located to monitor waste migration from the ponds and burial sites, NRC found that they did not do so. As a result, NRC required NFS to upgrade its monitoring program by drilling 22 new groundwater monitoring wells. Most of the wells were located near the ponds; NFS completed the wells in the fall of 1986.

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Texas Instruments, Inc., Attleboro, Massachusetts

Until 1959, the Texas Instruments, Inc. (TI) facility, located about 30 miles south of Boston, Massachusetts, was owned and operated by Metals and Controls, Inc. In 1955, the company received a license to fabricate fuel for research reactors. In 1959, the company merged with TI, which continued these operations under the same license.

In 1968, TI began to cut back its operations. In May 1982, TI requested that NRC terminate the license and release the building used for these activities for unrestricted use. Along with the request, TI submitted a radiological survey to NRC showing that the building met NRC's guidelines. NRC subsequently inspected the building and concluded that the remaining contamination was within NRC's guidelines. In 1983, NRC released the building from the license.

In January 1983, TI asked NRC to release a burial area that had been used to dispose of low-level radioactive waste. According to TI's 1964 health and safety manual, uranium- and thorium-contaminated noncombustible scrap material and machinery were put in 55-gallon drums and buried on-site between 1958 and 1960 under 10 CFR 20.304. TI provided NRC with a radiological survey report to support its request to release the land and terminate its license. The company took test samples of the waste and concluded that the level of radioactivity was so low that no one should receive a radiation dose in excess of 1 millirad per year to the lung or 3 millirads per year to the bone from inhalation or ingestion. These doses are within EPA's radiation protection standards. The report also pointed out that the radioactive material would only be accessible by digging into the soil. As a result, TI concluded that the waste should remain in place and that removing the large volume of contaminated soil (over 160,000 cubic yards) and transporting it to a licensed disposal site would neither be practical nor justifiable for public health reasons.

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Westinghouse Electric Corporation, Cheswick, Pennsylvania

In 1959 Westinghouse Electric Corporation received a license (SNM-338) to fabricate fuel for commercial and research reactors at its Cheswick, Pennsylvania, facility. Westinghouse performed these activities in four buildings—one was later transferred to another license that Westinghouse received from NRC. On August 20, 1974, NRC terminated the license but did not specify either the buildings or land that were released for unrestricted use.

On March 7, 1969, NRC issued Westinghouse a second license (SNM-1120) to perform research and development on mixed plutonium-uranium and uranium oxide fuels. Westinghouse used at least three buildings for these activities. The license is still active although Westinghouse has decontaminated two buildings, and NRC has released them for unrestricted use. Westinghouse used the buildings (7 and 8) to develop and fabricate the fuels. Building 7 was used for about 15 years, contained a plutonium and uranium laboratory, and was originally under license SNM-338. Building 8 was used for about 10 years to produce commercial and breeder reactor fuels on a developmental basis. In addition to the two buildings, NRC released other buildings and land under this license between September 1982 and June 1984.

After NRC terminated license SNM-338 in 1974, three previously unknown buried waste sites were found. According to Westinghouse officials, they have no records showing the number of burials that occurred, types and amount of substances buried, or part of the process that generated the waste. However, they found (1) 55-gallon drums containing gloves and building rubble in one area, (2) building rubble in another, and (3) plastic bottles, duct work material, and building rubble under an employees' softball field. According to NRC staff, they do not plan to take any enforcement action against the company because Westinghouse is taking corrective action by removing the waste and sending it to an NRC-licensed disposal site.

However, no certainty exists that Westinghouse discovered all previously used disposal sites. According to company officials, they do not know whether all buried waste sites have been found, but they are taking steps to make this determination. For example, the company has been digging up parts of the facility that have the highest potential as buried waste sites, such as areas located near buildings or in close proximity to the three sites already found. Despite the lack of disposal records, Westinghouse officials do not believe that the waste posed an environmental or health and safety concern.

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Exhibit 21

Exhibit 21 to the Petition of the Citizens Awareness network for a License Transfer hearing on the proposed transfer of Vermont Yankee Nuclear Power Station

Exhibit 21 entitled "Nuclear Installations Inspectorate, *Safety management Audit of British Energy Generation Limited and British Energy Generation (UK) Limited, (1999)*" may contain corporate confidential or proprietary information. It is being withheld from public release at this time and is being retained in Office of the Secretary, NRC files. A publically available summary of Exhibit 21 is Exhibit 22 to the petition. Removal of Exhibit 21 from the petition for public release of the petition has been coordinated with the petitioner.

Exhibit 22

Health and Safety Executive, *HM Nuclear Installations Inspectorate Safety Management Audit of British Energy Generation Limited and British Energy Generation (UK) Limited* (1999)

An audit by the HSE on British Energy Generation Limited and British Energy Generation (UK) Limited 1999

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ACKNOWLEDGEMENT

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Invaluable support was provided by many staff, in particular:

A.Cain	N Tunstall
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The audit team would also like to record their thanks to all of their colleagues who provided input to the audit and covered other work during the audit, and to the staff of British Energy Generation Limited and British Energy Generation (UK) Limited and their contractors without whose co-operation the audit would not have been successful.

FOREWORD

This report sets out the key findings of the team which carried out the safety audit of British Energy Generation Limited and British Energy Generation (UK) Limited, the two nuclear Licensees within British Energy plc. The audit was undertaken to review the capability of each Licensee to continue to discharge its responsibilities in the light of reductions in staff.

A multi-disciplinary team carried out a comprehensive review of both Licensees. The audit covered corporate management aspects, management of safety, ownership and control, retention of expertise, use of contractors and the proposed integration of the two Licensees. The main audit team comprised eleven nuclear inspectors from HSE's Nuclear Installations Inspectorate (NII), supported by other nuclear inspectors and an inspector from HSE's Operations Unit. The team started work at British Energy Generation Limited in March 1999 and moved on to British Energy Generation (UK) Limited in April 1999. This was followed by visits in May 1999 to some of the key contractors used by the Licensees.

The report presents a thorough analysis of the results from this work and makes recommendations for action to ensure the capability of British Energy Generation Limited and British Energy Generation (UK) Limited to discharge their responsibilities as nuclear Licensees is maintained or improved. The

issues raised by the audit, whilst significant over the medium to long term, do not challenge the immediate safety of the operating nuclear power stations.

British Energy Generation Limited and British Energy Generation (UK) Limited have so far shown a positive response to the findings and are in the process of addressing the recommendations arising from the audit. Their action plans, setting out the proposals and timescales for resolving the recommendations, are to be produced within four weeks of receipt of this report. HSE's Nuclear Installations Inspectorate will monitor progress to expedite a timely and satisfactory completion.

If you have any comments or would like further information on the issues discussed in this report, please write to the Chief Inspector of Nuclear Installations at the address below.

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EXECUTIVE SUMMARY

As part of restructuring and privatisation of the nuclear industry, the advanced gas cooled reactor (AGR) power stations and the single pressurised water reactor (PWR) station passed into the private sector in 1996. A holding company, British Energy plc (BE), was formed with two wholly owned subsidiaries, Nuclear Electric Limited and Scottish Nuclear Limited. The subsidiaries were responsible for operating the power stations and therefore were granted the nuclear site licences in line with the HSE policy (derived from the requirements of the Nuclear Installations Act) that the user of the site must hold the licence.

Staff numbers in the two subsidiaries had been reduced in the run up to privatisation. Shortly after privatisation, both Nuclear Electric and Scottish Nuclear instigated a systematic programme of further staff reductions. The downsizing process was known as 'Vision 2000' within Nuclear Electric and 'Route 21' within Scottish Nuclear. In 1997 and early in 1998, the Nuclear Installations Inspectorate (NII) undertook a series of inspections of the Licensees' arrangements for managing the staff reductions. These inspections established that the Management of Change processes were generally acceptable; however, in certain safety areas questions were raised about the application of the processes to already depleted staffing levels.

It had been NII's intention to undertake further (follow up) inspections in late 1998. Before the work was started, BE approached NII with proposals to integrate Nuclear Electric and Scottish Nuclear into a single Licensee. To demonstrate that an integrated organisation would function effectively as a single Licensee, BE proposed to integrate the technical management and the technical teams of the two Licensees for a limited period before formally applying for relicensing. This process would result in some loss of management posts. The target date proposed by BE for the integration of the central functions was 1 January 1999.

Towards the end of 1998, at a late stage in the relicensing discussions, BE divulged there were

commercial obstacles which made transfer to a single Licensee unattractive. Although BE recognised it could be some years before relicensing became commercially attractive, they still wished to proceed with the integration of the central functions on the proposed date namely, 1 January 1999. BE's intention is to retain two Licensees but to use an integrated management and central technical team to support the operation of the nuclear power stations of both licensees. This type of arrangement has not been used previously in the UK nuclear industry and presents NII with questions about the validity of the approach.

NII agreed to integration at the Board level and for some non-safety significant company functions; these changes took place in January 1999. However, agreement to integration in safety significant areas was withheld until an audit could be completed. The aim of the audit was to confirm that downsizing had not reduced the Licensees' capability to discharge their responsibilities and to deliver acceptable safety performance. The audit would also provide a baseline against which to judge further changes (including integration).

Another change took place on 1 January 1999. Nuclear Electric was renamed British Energy Generation Limited (BEGL) and Scottish Nuclear became British Energy Generation (UK) Limited (BEG(UK)L). The change of names did not invalidate the existing nuclear site licences and, hence, there was no need for applications for new licences.

In March and April 1999, NII audit teams visited the headquarters and technical centres of BEGL and BEG(UK)L. Visits were then made to some of the principal contractors who provide technical support to the Licensees. The NII teams interviewed a wide cross section of staff to gather information on which to make a judgement regarding the current situation in both Licensees. We were afforded unfettered access to talk to the staff. Their co-operation and openness greatly facilitated the work of the NII team. This report describes the findings from that work and makes recommendations for BEGL to BEG(UK)L to address.

The audit findings are focused on the areas for action to ensure the capability of BEGL and BEG(UK) L to discharge their responsibilities as Licensees is maintained or improved. Nevertheless, we have also highlighted a significant number of good points we found (or confirmed) during the audit. In particular, staff at all levels were committed to safe operation of the nuclear power stations. These good points have been taken into account in deciding upon the necessary regulatory action.

We consider the appropriate regulatory action is to require the downsizing process to stop whilst the recommendations arising from the audit are addressed. However, we judge that the issues which have been identified, whilst significant over the medium to long term, are not such that they challenge the immediate safety of the operation stations. The key issues are as follows.

The staff reduction programme in both Licensees had been predicated on the assumption that, in a privatised environment, they could reduce the amount of work (eg on plant modifications). In BEGL, staff reductions have in fact taken place even though there has not been the expected reduction in work load. The shortfall in resource has been met by placing greater reliance on contractors, some of whom are actually Licensee staff recently released under the downsizing programmes. In BEGL, the supervision of contractors is adding to the work load on the remaining in-house staff and in some areas we judge the staff reductions have gone too far. In BEG(UK)L, staff levels have been reduced in line with a reduction in the planned work load, but emergent work is at a much higher level than anticipated. BEG(UK)L has an even greater reliance upon contractors for technical support and, in some areas, its own staffing levels need to be increased.

In BEGL, we found no formal process by which the minimum skills base had been established (ie that which must be retained within the Licensee to enable it to discharge its duties under the licence). Thus the downsizing exercise was taking place without knowing the minimum resource requirements, or having a process to ensure they can be sustained over time. This has resulted in specialist expertise in several key areas (specific to the nuclear industry) being vested in single experts. Staff leaving to pursue their careers elsewhere have exacerbated this position since BEGL cannot easily find replacements with the requisite expertise and experience.

BEG(UK)L has developed a definition of its skills base by means of a register of posts which require suitably qualified and experienced people (SQEP) to fill them. The register identifies people who have the necessary qualifications and experience against the various posts. This approach to defining the skills base is welcomed, but it needs further development. For example, we found there are no formal criteria for judging whether qualifications and experience are adequate nor are there procedures to ensure removal of a person from the register if a skill is no longer being practised. In addition, BEG(UK)L does not have staff who can discharge the full range of identified skills and is reliant on external support to fulfill some SQEP roles. BEG(UK)L is thus unable, in all areas, to make decisions on safety matters based on the expertise of its own staff.

Neither Licensee has policies on the use of contractors to define, for example, the circumstances under which they should be employed and on what type of work, the level of responsibility that could be delegated to contractors, and the level of monitoring required to maintain Licensee ownership of the work. A variety of contractual arrangements exists. The closest relationships - namely partnerships in BEGL and satellite offices for BEG(UK)L - pose challenges with respect to loss of Licensee control, ownership of work and decisions derived therefrom, and loss of corporate memory.

In both BEGL and BEG(UK)L, the records show that some staff are working significant amounts of overtime. There is also under reporting of overtime so that the true situation must be worse than shown. Taking everything discussed above into account our judgement is that in some key safety areas in both BEGL and BEG(UK)L staff levels are at, and in a limited number of areas, below that required to sustain the work load and discharge the requirements of Licensees.

Our review of the application of the management of change process in BEGL and BEG(UK)L revealed flaws in both the processes and in their application. The way in which the processes have been applied has allowed preconditions (enablers), which should have been met before staff were released, to be relaxed to ongoing commitments. For example, a requirement to provide a trained replacement before someone leaves becomes simply 'provide training', which is open-ended. This has allowed staff to leave without having a ready replacement. We found examples of misapplication of the management of change process, including retrospective sign-off to justify release of staff who had already left (without completion of all the enablers) and examples where ongoing commitments had yet to be signed off long after someone had left.

We require BEGL and BEG(UK)L to address the recommendations arising from the audit. The Licensees need to provide an action plan within four weeks of receipt of this report, with proposals and timescales for resolving the recommendations. The key areas for action by the Licensees are as follows:

BEGL and BEG(UK)L to stop the planned reduction of in-house staff numbers until they can demonstrate their forward work predictions are reliable, and demonstrate that the Management of

Change processes will not adversely affect the safety of nuclear plants. BEGL and BEG(UK)L to ensure that business plans are matched to the in-house staff capability and perceived work load. BEGL and BEG(UK)L to formalise, record and resource the skills base that each requires to underpin the duties of a Licensee to retain ownership and control of its operations. BEGL and BEG(UK)L to develop and promulgate policies to identify the key considerations and to guide decision making on why, when and how to utilise contractor resource - including their 'intelligent customer' requirements. BEGL and BEG(UK)L to investigate the reasons for the high level of overtime worked in certain areas (including estimates of that not reported), and take steps to prevent excessive hours being worked by staff handling nuclear safety related work. BEGL and BEG(UK)L, as a matter of urgency, to critically review their Management of Change processes in order to ensure they will incorporate the lessons learned from the change process (including the findings of this audit).

As part of the audit, we also explored the potential impact of integration. To ensure there is a seamless transition into the integrated organisation with no diminution of standards of work or loss of control of the Licensees' operations, all staff require a clear understanding of revised responsibilities, changes in methods of work, and additions to their workload before integration goes ahead. We found that, although the proposed structure of the integrated organisation has been defined and the managers for the joint team have been selected, few of the staff below senior level seem to know what additional responsibilities they might have to undertake following integration. We were also told that there is no explicit allowance within most work programmes to cater for the extra demands of integration - which will include additional travel between the two central offices at Barnwood (Gloucester) and Peel Park (East Kilbride). These demands will be over and above the normal workload, which is already high in many areas. We wish to be reassured that the two Licensees are ready to integrate. BEGL and BEG(UK)L therefore need to clearly define their state of readiness for integration and demonstrate that adequate control of operations can be maintained in both Licensees.

The integration proposals put forward by British Energy (maintaining two separate Licensees for the foreseeable future) are novel and raise a potential problem which we had not previously considered in detail. The crux of the issue is the question of the acceptability, in nuclear licensing terms, of individuals in the central (integrated) team who work for one Licensee providing advice to the operating stations in the other Licensee. Each Licensee is expected to maintain control of its own operations and have its own intelligent customer capability. The arrangement proposed by British Energy could violate these principles. Resolution of these issues will be necessary before our agreement to the deferred integration proposals can be considered. The simplest way to overcome the problem would be to form BEGL and BEG(UK)L into a single Licensee.

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SECTION 4 : AUDIT FINDINGS

35. This section presents a summary of the key findings from the audit. The findings have been drawn from the results of our confidential interviews with a large number of staff within BEGL and BEG (UK)L and in key contractors; over 250 people in total. We were afforded unfettered access to talk to staff. Their co-operation and openness greatly facilitated the work of the NII team, and contributed to the success of the audit.

36. The findings are focused on the areas for action to ensure the capability of BEGL and BEG(UK)L to discharge their responsibilities as Licensees is maintained or improved. However, good practices we found or confirmed during the audit are also noted. These have been taken into consideration in deciding the regulatory action which needs to be taken, as discussed in the Conclusions (paragraph 77). It is important that the Licensees maintain and build upon these areas of good practice

4.1 Areas of Good Practice

37. The principal organisational structures of both Licenses have not changed fundamentally from what was in place at the time of privatisation in 1996. For example, both Licensees have maintained Health, Safety and Environment Divisions that are independent from the Engineering Divisions which produce technical work and safety cases. These organisational structures can be considered as 'tried and tested'.

38. Staff at all levels were committed to safe operation of the nuclear facilities; indeed the statement that 'safety is non negotiable' was put to us in many ways in the various interviews. This is an attitude that we had expected to find in the staff of nuclear Licensees. To back this up, we were given examples of situations where commercially advantageous work was being delayed to allow completion of safety related projects, and we found no indications that safety related issues were being suppressed.

39. The experienced staff we interviewed were of a uniformly high standard, technically proficient in their fields, and professional in their approach. They were of the expected calibre and are one of the Licensees' essential strengths.

40. The Directors and senior managers indicated they were aware of the potential pitfalls that downsizing can introduce. In particular, Directors confirmed they were aware of the problems encountered in nuclear companies elsewhere that have undergone downsizing. Directors also told us they recognised that the Licensees were the holders of a special technology and would ensure that no contractor would know more about an area than the Licensees.

41. The majority of managers had in place all the measures available to them to mitigate adverse impacts of the downsizing exercise. For example, in BEGL a management decision was taken to disseminate specialised graphite expertise to more than the one remaining expert. Other examples are the retention of the world class expertise in structural integrity methodology, the development of experience sharing programmes, and training programmes aimed at achieving professional recognition in new recruits and maintaining technical and managerial competence of more experienced staff. There is also a policy of bringing in new graduates to renew and refresh the technical core of the company.

42. The initial targets set for downsizing had, in some areas, been revised when managers had made cases to limit the reduction in staff numbers. Managers had also taken other steps to maintain threatened capabilities within the Licensees - for example by bringing research work in-house and holding internal technical groups at the minimum critical number to ensure functional expertise was not lost.

43. We found groups within the Licensees who consider that the downsizing has produced a better focus on both commercial and safety work, and improved their efficiency and effectiveness. They highlighted improved co-ordination on outage work (due to better definition of roles and responsibilities) and a reduction in the number of different technical groups involved in decision making.

44. We were encouraged by the development of policies on mental health of staff. In some Divisions, these have been translated into guidance on overtime. Senior managers were clearly aware of the potential problems of excessive overtime. It was also recognised at senior level that the staff need more 'time to think', an important factor particularly in specialist technical areas. We were told that there will be a period of stability, without large scale changes, once the current downsizing processes (Vision 2000 and Route 21) have been completed.

45. We found other noteworthy examples of good practices within different areas in the two Licensees. In BEG(UK)L, there is a formal register of Suitably Qualified and Experienced Personnel (SQEPs) - this will provide the basis for identifying and maintaining the requisite skills base within the Licensee. BEG(UK)L makes effective use of Technical Development Committees as a vehicle for co-ordinating work and linking between the centre and the stations. In BEGL there is a general philosophy to retain in-house technical specialists, rather than rely more upon generalists, which accords with the intelligent customer requirement placed upon Licensees.

46. Both Licensees expressed their desire to achieve world class standards, which is a laudable aim. The senior management are committed to improving all round performance in striving towards this aim.

47. This brief overview picture identifies many of the characteristics we expect to find in the management and staff of nuclear Licensees. Further examples of good practices are provided in

Appendix 2.

4.2 Areas for Further Action

48. The audit has revealed a number of areas where the Licensees need to take action to address problems or concerns. The key issues are discussed in this section, against each Licensee. The specific recommendations arising from the audit are set out in Appendix 3.

BEGL

49. A key factor in the Vision 2000 downsizing process was a predicted reduction in workload - 'doing less, with less'- which overall has not transpired. Nevertheless staffing levels have been reduced. Shortfalls in resource have been made up by employing additional contract staff, some of whom are ex-BEGL staff recently released on voluntary severance terms. In some of the key safety areas this has resulted in the work load on BEGL staff increasing, since they now have to deal with the safety issues plus supervision of contract staff.

50. We found that systems for work recording do not accurately reflect the number of hours being worked by staff. Our interviews with staff at different levels within BEGL revealed that some are working significant amounts of overtime or unpaid excess hours to keep abreast of the workload. Excessive and persistent demands upon the staff carry the potential for degradation of the quality of the product. Whilst BEGL recognise there is under-reporting of hours worked, which goes against company policy, it is not clear that it can gauge the extent of the problem. Further effort is required to match work loads with staffing levels and to ensure that there is an accurate measure of the hours staff are working (whether paid or not).

51. The inability to reliably predict the forward work load, as evidenced by the failure to achieve the 'doing less' (ie work reduction) prerequisite for Vision 2000, has clear implications for any future decisions on staff downsizing. When combined with the uncertainty over the actual numbers of hours being worked by staff, this emphasises the need for BEGL to ensure there is a firm foundation upon which to base its forward plans and staffing levels.

52. We had expected to find that BEGL had a clear definition of the skills base it needs to retain to enable it to discharge the responsibilities of a Licensee. Regardless of the impetus to downsize, BEGL cannot delegate these responsibilities to any other organisation. BEGL needs to maintain expertise within its own staff. We did not find a clear definition of the requisite skills base. The downsizing process has thus been taking place without knowing the overall limit - the minimum necessary skills base. BEGL needs to expedite the provision of a clear and accurate baseline for the range and depth of expertise it needs to retain as a Licensee. This needs to be combined with effective, long term succession planning to maintain and develop its technical expertise in nuclear matters over the lifetime of its nuclear facilities including decommissioning.

53. Downsizing has resulted in knowledge and expertise in some technical areas specific to the nuclear industry being vested in individuals (singleton experts) within BEGL. This leaves BEGL particularly vulnerable to loss of expertise - for example if such staff leave to pursue their careers elsewhere (as has happened). BEGL has found it difficult to find replacements with the necessary expertise and nuclear experience. BEGL cannot rely upon a policy that it will always be possible to buy in specialist nuclear expertise from the labour market. This needs to be taken into account when

setting the baseline for the in house skills base (with some element of 'defence-in-depth'). During the audit we identified areas where we consider BEGL needs to increase staffing levels to counter vulnerabilities such as singleton expertise or over reliance upon contractors.

54. BEGL has a variety of relationships with contracting organisations, from the employment of individuals from agencies, through standard contracts for specific pieces of work, to longer term partnership arrangements. However, BEGL does not have a formal policy setting down why, when and how to use contractor support (taking into account its responsibilities as a Licensee). We believe the lack of such a policy, combined with the lack of a clear baseline for the in house skill levels, has led to the situation where the present staffing levels in some areas in BEGL need to be increased (as above). BEGL needs to clearly define, and apply, an appropriate policy governing the use of contractors.

55. BEGL is developing closer relationships with key contractors - known as partners. In most cases, the partner organisations are well established in the nuclear field and undoubtedly can provide both expertise and experience. Nevertheless, regardless of the close relationships with BEGL, the partners must still be seen as contractors and BEGL cannot delegate any of its responsibilities as a Licensee under such arrangements. The use of partnerships is not ruled out in principle, however it raises issues such as loss of the Licensee's corporate knowledge and expertise, reduction in opportunities for technical development of Licensee staff, and ultimately the potential for loss of control and ownership of safety cases by the Licensee. In pursuing and developing partnerships (and in any other arrangements with external bodies), BEGL must ensure it retains the necessary range and depth of in house expertise to be able to subject work or advice received from external sources to informed and critical review before acting on it. Based on the audit findings, we believe the relationship between the BEGL and its partners needs to be reviewed as part of the development of an overall policy on the use of contractors.

56. Given the extent to which BEGL utilises contractors and partners, we had expected to find the concept of 'intelligent customer' and the requirements of the role to be well defined. However, we found only one manager who had anything formally written down on the role. BEGL needs to promulgate a company-wide policy on the intelligent customer role and requirements. Appendix 1 sets out the basis on which the intelligent customer capability was evaluated by the NII audit team.

57. During the audit, we focused on the outcome from BEGL's downsizing and management of change process rather than the process itself (which had been considered in previous inspections). However, some aspects of the execution of the management of change process did come under review. Based on past understanding, we expected that specific pre-conditions (enablers) would have to be satisfied before the person was released on voluntary severance, to ensure the organisation would be able to cope without that individual. Key amongst these enablers was a reduction in work, or establishing that a role was no longer required. In exceptional situations, we were aware that compensating measures such as work deferral, reallocation of responsibilities, deferring severance dates, or filling gaps with contractors would be deployed.

58. We found that these compensating measures have tended to become the norm, which explains how staff have been released under the management of change process without the concomitant reduction in work load. The process has also been misused in that some enablers have been met by means of changing pre-conditions to ongoing (open ended) commitments, which are not then always met before someone is released - for example, a requirement to 'provide a trained replacement before release' becomes simply 'provide training'. The small sample of records that we checked did not

provide confidence that the principles of the process had been honoured and the procedure followed rigorously. In our view a management of change process which can reduce a scarce resource down to a single person must, in any case, be open to question. BEGL needs to carefully review its management of change process to address these shortfalls.

BEG(UK)L

59. Under the downsizing (Route 21) process, the planned work load within BEG(UK)L has reduced, although the reduction does not quite meet the prediction. The management of change process in BEG(UK)L required staff to be retained in post until the work had actually reduced and we found this requirement had been honoured. However the amount of emergent work has been substantially underestimated and in some areas individual work loads are high.

60. Some staff are working significant amounts of overtime or unpaid excess hours. We also found that there is under-reporting of hours worked. The downsizing decisions are suspect when the forward work load cannot be accurately foreseen, even over reasonably short periods (2 or 3 years), and the amount of effort being applied with the present staffing levels has not been accurately determined. BEG(UK)L therefore needs to ensure that it has a sound basis for establishing its staffing levels needed to meet current and future requirements.

61. The register of Suitably Qualified and Experienced People (SQEPs) provides the means for establishing and maintaining the requisite skills base within BEG(UK)L. However, we found that in some technical areas there are no BEG(UK)L staff on the SQEP register, only contractors. We also found areas covered only by singleton BEG(UK)L experts, albeit backed in most cases by SQEP staff from the contractor support, and in at least one case there is a gap in the SQEP coverage (ie no cover by either Licensee or contractor staff). BEG(UK)L told us its formal objective is to have all SQEP posts covered by two staff, at least one of which is a BEG(UK)L employee. It needs to expedite the necessary action to meet this objective - this should be viewed as a minimum requirement but it would still leave BEG(UK)L vulnerable to loss of key specialist staff. In addition, BEG(UK)L needs to establish a clear baseline for the range and depth of expertise it needs to retain as a Licensee. This needs to be combined with effective, long term succession planning to ensure its technical expertise in nuclear matters is maintained throughout the full lifetime of the nuclear stations, including decommissioning.

62. When we examined the process for placing staff on the SQEP register, we found that practice varied in different sections of the organisation. We had expected to find specific criteria for each SQEP topic area, combined with requirements for refresher training. There should also be criteria covering removal from the register - for example, if individuals do not actively practice in an area of work for a given period the SQEP register entry should lapse. Overall, none of the sections in BEG (UK)L had all the criteria which we had expected to find. The SQEP register is a good concept but implementation of the concept needs further consideration and development.

63. Since its formation, BEG(UK)L (formerly Scottish Nuclear) has had a close relationship with external organisations which possess relevant expertise. These organisations are contracted to provide technical expertise, but under 'satellite office' arrangements whereby BEG(UK)L is able to nominate specific individuals to work on the contracts. These individuals meet the BEG(UK)L SQEP requirements and are included on the SQEP register. There are clearly potential advantages in such an arrangement, not least in ensuring the quality and consistency of the technical support. However, we found that in some areas BEG(UK)L is now over-reliant upon this support. Overall, downsizing has

resulted in a greater proportion of contractors filling SQEP roles, combined with an increase in the number of contractor staff on the SQEP register. This situation erodes the ability of the Licensee to demonstrate that it is in control through its own staff. BEG(UK)L needs to redress the balance, taking into consideration what is required within the Licensee.

64. BEG(UK)L does not have a formal policy on the use of contractors, nor on its 'intelligent customer' role. The lack of such policies, combined with the lack of a clear baseline for the in-house competence requirements, have no doubt been significant factors which have led to the present situation. BEG(UK)L needs to adopt a clear policy on the use of contractors, together with its intelligent customer role and requirements, which take into account the limitations on the extent that reliance can be placed upon contractors due to BEG(UK)L's responsibilities as a Licensee.

65. The management of change process within BEG(UK)L was not targeted specifically during the audit. Previous inspections by NII had looked at the process itself; the focus this time was on the outcome from the process. However some aspects of the process did come under review. Our interviews revealed a similar picture to BEGL in that we found enablers requiring pre-conditions to be met had been relaxed to ongoing commitments. Also, as with BEGL, the process has led to singleton experts (or none at all) in some areas - notwithstanding BEG(UK)L's efforts to reduce the areas of singleton coverage. BEG(UK)L needs to carefully review its management of change process to resolve these problems.

Integration of BEGL and BEG(UK)L

66. As discussed in Section 1, British Energy has put forward proposals to integrate the technical management and resources of the two Licensees, BEGL and BEG(UK)L. We have not yet agreed to these proposals and the potential impact of integration was one of the areas we explored during the audit.

67. We consider that all staff require a clear understanding of their revised responsibilities, changes in methods of work, and any additions to their workload before integration goes ahead. This is to ensure that there is a seamless transition into the integrated organisation with no diminution of standards of work or loss of control of the Licensees' operations. We found that, although the proposed structure of the integrated organisation has been defined and the managers for the joint team have been selected, few of the staff below senior level seem to know what additional responsibilities they might have to undertake following integration. We were also told that there is no explicit allowance within most work programmes to cater for the extra demands of integration - which will include additional travel between the two central offices at Barnwood (Gloucester) and Peel Park (East Kilbride). These demands will be over and above the normal workload, which is already high in many areas. We wish to be reassured that the two Licensees are ready to integrate. BEGL and BEG(UK)L therefore need to clearly define their state of readiness for integration and demonstrate that adequate control of operations can be maintained in both Licensees.

68. The integration proposals put forward by British Energy are novel and raise a potential problem which we had not previously considered in detail. The crux of the issue is additional responsibility placed on managers, the additional workload and hence their ability to adequately control and supervise safety related activity. Additionally, there is the question of the acceptability, in nuclear licensing terms, of individuals in the central (integrated) team who work for one Licensee (eg BEGL) providing advice to the operating stations in the other Licensee. Each Licensee is expected to maintain control of its own operations and have its own intelligent customer capability. The

arrangement proposed by British Energy could violate these principles. Some common functions already exist between the two Licensees - notably civil engineering and electrical engineering expertise - and the audit has raised questions in these areas. Whilst these specific changes were not deemed unacceptable by NII in the past, the current proposals for integration on a much broader scale have caused us to look closely at the wider licensing implications. Resolution of these issues will be necessary before our agreement to the deferred integration proposals can be considered.

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APPENDIX 3 : LIST OF RECOMMENDATIONS

This Appendix presents a list of all the recommendations arising from the audit process. The listing is as follows: Recommendations for BEGL; Recommendations for BEG(UK)L; Recommendations on Integration; and Recommendations from the Conclusions. For BEGL and BEG(UK)L, the recommendations are grouped under the subject areas of: Corporate Management Aspects; Management of Safety; Use of Contractors; and Divisional Findings. The latter comprise recommendations associated with specific areas of each Licensee's organisation.

RECOMMENDATIONS FOR BEGL

Corporate Management Aspects

Recommendation 1: BEGL to review its approach to communicating policy and strategy to staff to ensure that messages are received, understood, and acted upon.

Recommendation 2: BEGL to ensure members of BE Group who influence strategic direction in areas which impact on nuclear safety are suitably knowledgeable on nuclear industry requirements and standards.

Recommendation 3 : BEGL to review the organisational management philosophy to ensure that safety related tasks are being carried out effectively.

Recommendation 4 : BEGL to reconsider the decision to disband the Projects and Station Support Branch and provide a clear justification of any subsequent decision including proposals for the strengthening of the management of safety related projects.

Management of Safety

Recommendation 5 : BEGL to formalise, record and resource the skills base that it requires to underpin the duties of a Licensee to retain ownership and control of its operations.

Recommendation 6 : BEGL to develop and promulgate a policy and guidance on the retention of safety related expertise required to discharge its responsibilities under the Licence.

Recommendation 7 : BEGL to put in place the necessary arrangements to ensure that key expertise and corporate knowledge is retained within the organisation.

Recommendation 8 : BEGL to review the succession planning process and demonstrate that it can maintain the supply of suitably qualified and experienced personnel, taking account of future needs, age profiles and the technical specialisms required.

Recommendation 9 : BEGL to reinforce the requirement that overtime recording is mandatory for all staff at all levels, monitor compliance with the requirement, and act on the outcomes.

Recommendation 10: BEGL to investigate the reasons for the high level of overtime worked in certain areas (including estimates of that not reported), and take steps to prevent excessive hours being worked by staff handling nuclear safety related work.

Recommendation 11: BEGL to ensure that business plans are matched to the in house staff capability and work load.

Recommendation 12: BEGL to reconsider the options for the recognition of the value and reward of specialist expertise to ensure career paths for specialists remain attractive.

Recommendation 13: BEGL to demonstrate that the training strategy ensures the balance of training between the centre and the stations is appropriate. Recommendation 14 : As a matter of urgency, BEGL to critically review the Management of Change process in order to ensure it will incorporate the lessons learned from the change process thus far (including the findings from this audit). Recommendation 15 : BEGL to stop the planned reduction of in-house staff numbers until it can demonstrate the forward work prediction is reliable, and demonstrate that the new Management of Change procedure will not adversely affect the safety of nuclear plants. **Use of Contractors** Recommendation 16 : BEGL to develop and promulgate a policy to identify the key considerations and to guide decision making on why, when and how to utilise contractor resource.

Recommendation 17 : BEGL to reconsider its philosophy for the use of Agency staff and the arrangements for the maintenance of their technical skills.

Recommendation 18 : BEGL to review the performance of recent contracts and the process for dissemination of contract performance as part of the development of the policy on use of contractors.

Recommendation 19 : As part of the work on developing a policy on the use of contractors, BEGL to review the type of work that can be handled by partners and the arrangements for direction and monitoring of such work.

Recommendation 20 : BEGL to review its dependency on contractor support in specialist technical areas and derive formal contingency plans to secure that support against events such as contractors

ceasing to trade, change of ownership and withdrawal of services.

Recommendation 21 : As part of the development of the policy on the use of contractors, BEGL to reconsider the induction and refresher training required by contract staff.

Recommendation 22 : As part of the work to support the development of the policy on use of contractors, BEGL to initiate a formal procedure for routine checking of a sample of the quality of contractors.

Recommendation 23 : BEGL to consider the benefits of involvement in the industry wide initiatives relating to use of contractors (eg recording of contractor performance).

Recommendation 24 : BEGL to develop and document procedures which ensure the contract strategy covers all safety aspects.

Divisional Findings

Recommendation 25 : BEGL to reverse the trend to use contractors for safety related activities and increase the in-house staff levels in the Structural Assessment Group to ensure adequate control and ownership of the work.

Recommendation 26 : BEGL to address the current vulnerabilities in the Materials Group regarding the areas of singleton expertise and current skills shortages, and provide longer term plans to sustain the key skill areas.

Recommendation 27 : BEGL to address the current skills shortages in the NDT Group and provide longer term plans to sustain the key skill areas.

Recommendation 28 : BEGL to clearly define the necessary skills and experience for staff in the Safety Case Production Group, and to demonstrate a viable succession plan to sustain the work of the Group.

Recommendation 29 : BEGL to urgently review the working of the partnership arrangement in the structural integrity area to ensure that the sub-contracting of work by the partner is appropriate and that all contractor staff are suitably qualified and experienced to undertake their assigned tasks.

Recommendation 30 : BEGL to ensure sufficient time for mentoring new recruits is maintained in the work planning for existing staff.

Recommendation 31 : BEGL to strengthen the resources in the Human Factors area and to provide a programme to undertake more proactive work in this field.

Recommendation 32 : BEGL to ensure that staffing reductions under Vision 2000 do not diminish the operating experience feedback service provided to Engineering Division.

Recommendation 33 : BEGL to define the minimum sustainable level of PWR expertise required to meet current and future nuclear safety requirements and to ensure that the number of suitably

qualified and experienced staff is maintained at or above this level.

Recommendation 34 : BEGL to clearly define the requirements for the civil engineering interface role within Engineering Division and to provide appropriate procedures and guidance to enable the 'intelligent customer' responsibilities to be fulfilled.

Recommendation 35 : BEGL to ensure that the training and development provided to staff in partner contractors is commensurate with that provided to its own staff doing equivalent work, including the acquisition and updating of plant knowledge.

Recommendation 36 : BEGL to put in place measures to ensure staff in partner contractors are as well informed as would be the case if work was undertaken within BEGL.

Recommendation 37 : BEGL to allow time for, and encourage staff to participate in, research and development activities.

Recommendation 38 : BEGL to strengthen the available expertise in the criticality, graphite and severe accident areas.

Recommendation 39 : BEGL to formally define the range and level of expertise required to be an 'intelligent user' of all computer codes used in safety analysis work, and to ensure the necessary expertise is retained and developed within BEGL

Recommendation 40 : BEGL to provide more resources on fire protection, including a review of the decision to abolish the post of company fire safety officer, and undertake more proactive work at nuclear stations.

Recommendation 41 : BEGL to recover the in house capability for radiation chemistry expertise.

Recommendation 42 : BEGL to clearly define the requirements for the electrical engineering interface role within Engineering Division and to provide appropriate procedures and guidance to enable the 'intelligent customer' responsibilities to be fulfilled.

Recommendation 43 : BEGL to review the partnership arrangement for C&I support to define those tasks which should be carried out only by BEGL staff, and to ensure that control and ownership of work always resides with BEGL.

Recommendation 44 : BEGL to provide a status report on the safety case management initiatives, including a review against the findings from the NII safety case inspection in 1997.

Recommendation 45 : BEGL to increase the level of suitably qualified and experienced personnel available to the Periodic Safety Review area of work.

Recommendation 46 : BEGL to provide an adequate level of PSA expertise within Engineering Division to meet current and future workloads, including the implementation of its forward strategy regarding the use of PSAs.

Recommendation 47 : BEGL to ensure that HSED Assessment and Consents Branch is adequately resourced to undertake a full range of independent assessment and review activities, including

maintaining an internal overview of the INSA process.

Recommendation 48 : BEGL to formally define the requirements for staff to be suitably qualified and experienced in HSED Assessment and Consents Branch (in particular for the specific INSA posts).

Recommendation 49 : BEGL to ensure sufficient staff are available to carry out the INSA process and monitor the use of contractors for technical support to the INSA process to ensure independence is not compromised. Recommendation 50 : BEGL to ensure that the quality and depth of the INSA examination is maintained.

Recommendation 51 : BEGL to review the function of HSED site inspectors and ensure staffing levels in HSED Inspection and Standards Branch are sufficient to cope with the existing work load without the need for excessive amounts of overtime working.

Recommendation 52 : BEGL to transfer the HSED role of monitoring the Management of Change process in Engineering Division from Inspection and Standards Branch to Assessment and Consents Branch, and provide the necessary resources.

Recommendation 53 : BEGL to make a robust safety case for the proposal to integrate industrial safety inspection into the Occupational Health Group, prior to implementing the change.

Recommendation 54 : BEGL to ensure that its radiological protection standards are maintained and, wherever practicable, improved and the necessary expertise to achieve this aim is retained within BEGL.

Recommendation 55 : BEGL to ensure the Procurement Department has sufficient staff to discharge its role and responsibilities, principally with respect to the provision of added safety value and contractor performance monitoring.

Recommendation 56 : BEGL to improve the dissemination of information on contractor performance.

Recommendation 57 : BEGL to ensure the different contractual relationships and the interface requirements are clearly defined and are commonly understood and applied throughout BEGL.

Recommendation 58 : BEGL to define the corporate QA strategy and the approach to the management of quality throughout BEGL covering the stations, Engineering Division, the corporate centre and contractors.

Recommendation 59 : BEGL to ensure that the Corporate Quality Department is adequately staffed to implement and maintain the corporate QA strategy.

Recommendation 60 : BEGL to define the role and influence of the Business Review and Audit Department (BRAD) and the main BE Board on its activities as a Licensee.

Recommendation 61 : BEGL to ensure that a practicable solution to the problems regarding harmonisation of QA strategies, procedures and practices is identified prior to integration with BEG (UK)L.

Recommendation 62 : BEGL to review the role and scope of responsibilities for the Emergency Planning Group to improve its ability to discharge the function of maintaining and improving standards of emergency response.

Recommendation 63 : BEGL to ensure that the emergency response capability is not compromised by changes in the Information Management Department (IMD) and to put in place specific performance measures to monitor the impact of reductions in IMD staff.

Recommendation 64 : BEGL to review the operational experience feedback process, and the role of the Central Feedback Unit, to ensure its effectiveness and to introduce measures to demonstrate its effectiveness.

Recommendation 65 : BEGL to ensure (and demonstrate) that the Human Resource Department has the requisite level of staff to effectively perform its function.

RECOMMENDATIONS FOR BEG(UK)L

Corporate Management Aspects

Recommendation 66 : BEG(UK)L to review its approach to communicating policy and strategy to staff to ensure that messages are received, understood, and acted upon.

Recommendation 67 : In support of work on Recommendations 66 and 1, BEG(UK)L & BEGL to ensure that full integration and split site working will not adversely affect their communication systems and organisational culture.

Management of Safety

Recommendation 68 : BEG(UK)L to recover its full in house intelligent customer capability.

Recommendation 69 : BEG(UK)L to review its policy and practice for the appointment of SQEPs to ensure an appropriate range of the necessary topic areas, sufficiency in numbers and coverage of all topics by direct employees of the Licensee.

Recommendation 70 : BEG(UK)L to formally review and develop the SQEP register concept to identify criteria to be met before a person can be entered on the register and requirements for maintenance of skills.

Recommendation 71 : BEG(UK)L to develop into a formal procedure the guidance for decision making on SQEP capability of candidates to include, inter alia, requirements for the situation where the Section Manager's technical discipline does not allow direct assessment to be made.

Recommendation 72 : BEG(UK)L to develop the formal process of review of the SQEP Register to consider longer term requirements (say over 10 years) and maintain a sufficient number of suitably

qualified and experienced staff.

Recommendation 73 : BEG(UK)L to ensure that business plans are matched to the in house staff capability and workload.

Recommendation 74 : BEG(UK)L to reinforce the requirement that overtime recording is mandatory for all staff at all levels, to monitor compliance and act on the results.

Recommendation 75 : BEG(UK)L to investigate the reasons for the high level of overtime worked in certain areas (including estimates of that not reported), and take steps to prevent excessive hours being worked by staff handling nuclear safety related work.

Recommendation 76 : As a matter of urgency, BEG(UK)L to critically review the Management of Change process in order to ensure it will incorporate the lessons learned from the change process thus far (including the findings from the audit).

Recommendation 77 : BEG(UK)L to stop the planned reduction of in-house staff numbers until it can demonstrate the forward work prediction is reliable, and demonstrate that the new Management of Change procedure will not adversely effect the safety of nuclear plants.

Use of Contractors

Recommendation 78 : BEG(UK)L to develop and promulgate a policy to identify the key considerations and to guide decision making on why, when and how to utilise contractor resource.

Recommendation 79 : BEG(UK)L to review its dependency on contractor support in specialist technical areas and derive formal contingency plans to secure that support against events such as contractors ceasing to trade, change of ownership and withdrawal of services.

Recommendation 80 : BEG(UK)L to produce arrangements for working with the satellite offices which clearly define and formalise the roles of the Licensee and the contractor.

Divisional Findings

Recommendation 81 : BEG(UK)L to address the status of the Fuel Route Group, review the in-house resource levels and demonstrate there are adequate plans to retain and develop fuel route expertise.

Recommendation 82 : BEG(UK)L to review the overall forward work load in the fuel route area to ensure adequate resources are available for safety related work.

Recommendation 83 : BEG(UK)L to reconsider the competencies that must be retained within the Licensee in the Nuclear Technology Section and provide BEG(UK)L SQEP personnel to cover these areas of expertise.

Recommendation 84 : BEG(UK)L to reconsider the procedures for acceptance of safety related work

from contractors to ensure it receives an informed review by their SQEP personnel so that they can demonstrate control and ownership of the work.

Recommendation 85 : BEG(UK)L to reconsider the degree of Human Factors expertise it requires, and how best to deliver that expertise.

Recommendation 86 : BEG(UK)L to allow time in work plans for staff to be involved in research activities pertinent to their expertise and the company's interest.

Recommendation 87 : BEG(UK)L and BEGL to develop the interface agreements between the Civil Design Group and other parts of the licensees to clarify the roles and responsibilities and to ensure that a clear specification of the work required reaches the Civils Group.

Recommendation 88 : BEGL AND BEG(UK)L to clarify the arrangements to support the gas turbine standby supply capability on BEGL stations.

Recommendation 89 : BEG(UK)L and BEGL to review the forward work load for the Electrical group, recognising the travel burden, to confirm additional personnel are not required.

Recommendation 90 : BEG(UK)L to review the procedures for the specification, direction, and monitoring of work undertaken by satellite offices to ensure BEG(UK)L can demonstrate ownership of the product and understanding sufficient to allow appropriate safety related decisions to be made.

Recommendation 91 : BEG(UK)L to provide in house expertise to cover the required SQEP posts within HSED and ensure safety significant issues are assessed in house.

Recommendation 92 : BEG(UK)L to institute a system for review of the INSA process and to maintain an overview of the INSA process.

Recommendation 93 : BEG(UK)L to review incidents at stations during the downsizing exercise to determine root causes and establish whether loss of corporate memory has been a factor.

Recommendation 94 : BEG(UK)L to explain how it will ensure each Licensee is in control of its own procurement in the period after integration and before relicensing as a single Licensee.

Recommendation 95 : BEG(UK)L to introduce measures to enhance collection and dissemination of contractor safety reports - both before and after computerisation.

Recommendation 96 : BEG(UK)L to formalise the process by which the QA expertise is developed and maintained throughout the organisation.

Recommendation 97 : BEGL and BEG(UK)L to complete a critical review of the working of the QA function across both Licensees to identify best practice and standards for adoption.

Recommendation 98 : BEG(UK)L to review the data available to ensure an integrated view of an individual's experience is available as part of the SQEP review process.

Recommendation 99 : BEG(UK)L to review the inputs into the additional hours worked figures to ensure they are representative of the whole of the Licensee.

RECOMMENDATIONS ON INTEGRATION

Recommendation 100 : BEGL and BEG(UK)L to define their state of readiness for integration and to demonstrate that adequate control of operations can be maintained throughout both Licensees (encompassing awareness of responsibilities, familiarity with procedures and work loads on staff).

Recommendation 101 : BE to demonstrate how advice from a central technical team member of one Licensee to operating staff in the other Licensee will be reviewed by the intelligent customer of the operating Licensee.

RECOMMENDATIONS FROM CONCLUSIONS

Recommendation 102 : BEGL to address the recommendations in this report by providing an action plan, to be completed within four weeks of receipt of this report, with proposals and timescales for resolving the recommendations.

Recommendation 103 : BEG(UK)L to address the recommendations in this report by providing an action plan, to be completed within four weeks of receipt of this report, with proposals and timescales for resolving the recommendations.

REFERENCES

1. Nuclear Installations Act 1965 (as amended) Ch 57 - HMSO ISBN 0 10 850216
2. Restructuring and Privatisation of the UK Nuclear Power Industry - Report on the Work by the Health and Safety Executive to Grant Replacement Nuclear Site Licences: NUC 9, May 1996
3. The Ionising Radiation Regulations 1985 SI 1985 No 1333 - HMSO ISBN 0 11 057333 1
4. Nuclear Site Licences under the Nuclear Installations Act 1965 (as amended), Notes for Applicants HSG 120 HSE Books 1994 - HMSO ISBN 0 7176 0795 X
5. Successful Health and Safety Management HS(G)65 HSE Books 1997 - HMSO ISBN 0 7176 1276 7
6. Managing for Safety at Nuclear Installations HSE Books 1996 - HMSO ISBN 0 7176 1185 X
7. Health and Safety at Work etc Act 1974 Ch 37 - HMSO ISBN 0 10 543774 3

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British Energy Generation Limited and British Energy Generation (UK) Limited 1999

SECTION 5 : CONCLUSIONS

69. The objective of the audit was to establish whether the resources and the overall capabilities of BEGL and BEG(UK)L were such that they could continue to discharge their responsibilities as nuclear Licensees in the light of their staff reduction programmes. The findings are based on the information we obtained from confidential interviews with a wide cross section of the staff within BEGL and BEG(UK)L, focused upon the headquarters and technical centres at Barnwood in Gloucester (BEGL) and Peel Park in East Kilbride (BEG(UK)L, and in key contractors.

70. The audit has identified issues which could impact on the licensability and safety performance of BEGL and BEG(UK)L unless effective corrective actions are taken. The report focuses on the areas for action to ensure the capability of BEGL and BEG(UK)L to discharge their responsibilities as Licensees is maintained or improved. However, we have also identified aspects of good practice or characteristics of the type we expect from nuclear Licensees.

71. The overriding issue is the lack of a clear definition of the requisite skills base that must be retained within both BEGL and BEG(UK)L to fulfill their responsibilities as Licensees. This is combined with the absence of formal policies covering the use of contractors to provide technical resources and expertise, in particular to define the extent to which reliance upon contractors is allowable.

72. There are related issues which include the need for a long term strategy to ensure retention and development of the expertise required within the Licensees throughout the lifetime of the nuclear power stations (including decommissioning). Also, there is a lack of formal and viable contingency plans to address the Licensees' vulnerability to loss of key contractors.

73. The management of change process in both Licensees is in need of urgent review. In each Licensee there are flaws in both the process and in its application. For example, the change process has not prevented the creation of areas of singleton expertise, which makes both Licensees vulnerable to loss of key individuals. There are also cases where staff have been released without the necessary prerequisites having been achieved (eg a reduction in work, or the provision of a suitably qualified and experienced replacement).

74. A reduction in work load was a principal factor in the downsizing aims of both Licensees.

However, forward predictions of the work load (taking into account emergent work) is difficult to achieve accurately. The staffing level targets in both Licensees and their management of change process need to recognise this uncertainty.

75. There are issues to be resolved before the proposed integration of the management and technical teams in BEGL and BEG(UK)L could be agreed by NII. The primary issue is the ability of each Licensee to demonstrate it will retain control of its operations, as required under the nuclear site licences. The additional work load and responsibilities placed upon staff are part of the issue.

76. The key areas for action by the Licensees are as follows (the specific recommendations are presented in Appendix 3):

BEGL and BEG(UK)L to stop the planned reduction of in-house staff numbers until they can demonstrate their forward work predictions are reliable, and demonstrate that the Management of Change processes will not adversely affect the safety of nuclear plants.
BEGL and BEG(UK)L to ensure that business plans are matched to the in-house staff capability and perceived work load.
BEGL and BEG(UK)L to formalise, record and resource the skills base that each requires to underpin the duties of a Licensee to retain ownership and control of its operations
BEGL and BEG(UK)L to develop and promulgate policies to identify the key considerations and to guide decision making on why, when and how to utilise contractor resource - including their 'intelligent customer' requirements.
BEGL and BEG(UK)L to investigate the reasons for the high level of overtime worked in certain areas (including estimates of that not reported), and take steps to prevent excessive hours being worked by staff handling nuclear safety related work
BEGL and BEG(UK)L, as a matter of urgency, to critically review their Management of Change processes to ensure they incorporate the lessons learned from the shortfalls in the processes (including the findings of this audit).
BEGL and BEG(UK)L to resolve licensing, control and state of readiness issues before seeking NII agreement to the proposed integration of the technical management and resource teams within BEGL and BEG(UK).

77. We judge that the issues raised, whilst significant over the medium to long term, are not such that they challenge the immediate safety of the operating stations.

78. BEGL and BEG(UK)L are producing action plans to address the recommendations arising from the audit. These action plans are to be completed within four weeks of receipt of this report. We will

progess this work with the two Licensees to expedite a satisfactory resolution of the recommendations.

79. The commercial pressures on BEGL and BEG(UK)L will remain, if not increase. Both Licensees will need to remain aware of the issues raised in this report and their need to have an adequate management structure and sufficient of their own resources to discharge the obligations and liabilities associated with the holding of a nuclear site licence.

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An audit by the HSE on British Energy Generation Limited and British Energy Generation (UK) Limited 1999

SECTION 1 : INTRODUCTION

1.1 Circumstances Leading Up to the Audit

1. Prior to the privatisation of the electricity generation industry, the operators of nuclear installations were primarily government-owned organisations: they had expertise, financial security and considerable technical resources. The operators - the nuclear Licensees - were characterised by their high technical competence which was in keeping with their responsibility for safety under UK law (Reference 1). It is also consistent with the non-prescriptive nature of the UK regulatory regime. The same characteristics of expertise, financial security and technical resources are still required of any new organisation requesting a licence.

2. The UK nuclear generating industry has evolved from the former Central Electricity Generating Board (CEGB) and the South of Scotland Electricity Board (SSEB). Over recent years the industry has been restructured. HSE's Nuclear Installations Inspectorate (NII) has responded by assessing the proposals for each stage of major change to ensure that standards of safety are not compromised.

3. Under the restructuring of the industry in 1996, the Advanced Gas cooled Reactor (AGR) power stations and the single Pressurised Water Reactor (PWR) power station passed into the private sector. A holding company, British Energy plc (BE), was formed with wholly owned subsidiaries (Nuclear Electric and Scottish Nuclear) responsible for operating the AGR and PWR power stations. These subsidiaries (not the holding company) were granted new licenses for the nuclear station sites in line with HSE's policy that the user of a site must hold the licence (Reference 4). Nuclear Electric and Scottish Nuclear were subsequently renamed British Energy Generation Limited (BEGL) and British Energy Generation (UK) Limited (BEG(UK)L).

4. Licensing involves a detailed consideration of all the factors that establish prospective Licensees are capable of fulfilling their duties and responsibilities as a user of a nuclear licensed site. Licensees need to have in place the policies, structures, systems and resources necessary to ensure that safety is not, and will not be, compromised. The licensing of British Energy's subsidiaries is explained in more detail in Reference 2.

5. Prior to the granting of new Licences in 1996, NII undertook a series of inspections to establish

that the companies as constituted had sufficient staff and material resource and adequate systems and structures to be able to continue to discharge the responsibilities of a nuclear Licensee. While the situation was considered acceptable for the purpose of granting licences, there were issues which the NII decided would require to be checked as the experience of running the companies developed. Such issues were the level of resource in certain specialist areas and the extent and nature of their use of contractors.

6. The total numbers of Nuclear Electric and Scottish Nuclear staff were being reduced in the run up to privatisation, in part as other companies were being split off as part of the restructuring process. Shortly after restructuring in 1996, Nuclear Electric and Scottish Nuclear each instigated a systematic programme of staff reductions. The downsizing process was known as 'Vision 2000' within Nuclear Electric and 'Route 21' within Scottish Nuclear. In 1997 and early 1998, NII undertook a series of inspections on the Licensees' arrangements for managing their staff reductions. The process was amended in the light of NII's findings. NII was satisfied that, if applied rigorously, the outcome of the Management of Change process should lead to staff numbers sufficient to ensure that safety performance would not be compromised. However, the inspections highlighted a number of areas needing further consideration and/or action by the Licensees. These were progressed to an agreed position with the Licensees in early 1998, with NII intending to undertake a follow-up inspection later in the year.

7. Prior to the follow-up taking place, British Energy approached NII with proposals to integrate Nuclear Electric and Scottish Nuclear into a single Licensee. As part of these proposals, the intended structure of the new Licensee was to be demonstrated as acceptable by an interim period of operation using the new integrated structure, leading to licensing. It was recognised that the licensing process could be protracted because of other factors such as renegotiation of discharge authorisations.

8. British Energy proposed a target date of 1 January 1999 to move to the integrated position. In essence the proposal involves the bringing together of the technical management and resources across both Licensees with the concomitant loss of some of the existing management team. At a late stage in the discussions with NII, British Energy divulged there were commercial obstacles which made transfer to a single Licensee unattractive in the short term. The period of delay could not be accurately defined, and it was suggested that it could be some years before the commercial situation would allow a cost effective integration.

9. In spite of the obstacles British Energy still wished to proceed with the integration of the technical teams on the proposed date. They proposed to run the two companies using an integrated management and central technical team to service the operating stations. NII agreed to the integration at Board level, and with respect to certain non-safety related corporate functions. However, because of concerns about safety performance in BE, NII withheld agreement to full integration pending an audit of the two Licensees. The audit was intended to fulfill two main objectives, namely to determine if downsizing of the Licensees had reduced their capability to deliver acceptable safety performance, and to provide a baseline against which to judge future changes (notably integration).

10. NII was concerned with the performance of the two Licensees because of a variety of problems. These included the quality of recent Periodic Safety Review (PSR) submissions, the inability of the Licensees to deliver promised PSR modifications to programme, the inability to offer longer term commitments in areas such as research and the quality of some technical advice. These problems were followed up individually, but the frequency and consistency of the observed problems started to suggest a systemic underlying weakness.

11. Experience, both national and international, indicates that downsizing and contractorisation can have a detrimental effect on safety performance which is not always immediately obvious. However, it should be emphasised that NII has for some time recognised the increasing trend in industry to transfer work to contractors including management activities. NII is not opposed to contractorisation per se, provided it does not undermine the ability of Licensees to fulfill their responsibilities and the safety interfaces with contractors are properly defined and managed.

12. This report highlights good points found during the audit, then focuses on the key issues we found and makes recommendations for action by the Licensees. The report starts by outlining the terms of reference and methodology for the audit and the legal requirements of the Licensees.

1.2 Terms of Reference for the Audit

13. The terms of reference given to the audit team were:

To audit the capability of British Energy's two nuclear Licensees - British Energy Generation Limited (BEGL) and British Energy Generation (UK) Limited (BEG(UK)L) - to continue to discharge their responsibilities in the light of staffing reductions from the Vision 2000 and Route 21 processes;

To report to HM Chief Inspector of Nuclear Installations.

1.3 Audit Methodology

14. The audit team comprised a core of 10 nuclear inspectors, led by a Superintending Inspector from NII. The core team was supplemented when required by other nuclear inspectors and also had the assistance of an inspector from HSE's Operations Unit. The focus of the audit was the BEGL headquarters and technical centre at Barnwood, Gloucester and the BEG(UK)L centre at Peel Park, East Kilbride. The audit addressed the key safety areas - Corporate Management, Engineering Division, Health Safety and Environment Division, and Operations Division.

15. Some of the team members had been involved in the previous inspections of British Energy in 1996 (for privatisation) and in 1997/98 (for the management of change process) and were familiar with the Licensees' key documentation such as Management of Change procedures, the Safety Management Prospectus and the Company Manual. The team also comprised members who had experience of similar audits at other Licensees (eg Dounreay). The audit approach was based upon collecting information by interviewing personnel at all levels, and checking the findings against relevant documentation provided by the Licensee. The key difference compared with the previous inspections in 1997/98 was that this audit focused on the outcome and implications of downsizing rather than the process for managing change.

16. As part of the preparations, one team had visited a station prior to starting the audit to examine the interface between the station and the central functions. NII site inspectors had also undertaken some preliminary work on sites to identify any issues that the team should pursue prior to the start of the audit.

17. In addition to the Licensee's corporate functions, the audit also included organisations providing significant technical support to the Licensee. Following on from and informed by the time spent within the Licensees, members of the audit team visited some of the principal contractors used by either BEGL or BEG(UK)L. This enabled us to examine the relationship between the Licensees and principal contractors from both ends and, in particular, to establish how the Licensees were meeting the 'intelligent customer' requirement (see Section 3.3).

18. Any audit is a sampling process and this was no exception. However, at some levels within BEGL and BEG(UK)L we interviewed all the staff. At others we interviewed sufficient staff to ensure we had a representative cross section of staff views across all the Divisions which we judged had a significant impact on the safe operation of the Licensees' nuclear facilities. Whenever we find problems based on a sampling approach, it is incumbent upon the Licensees to demonstrate there are no inherent weaknesses in their approach.

19. The standards against which we judged adequacy are all published material, either in the form of legislation, in a White Paper or in HSE documents which set out good practice in the management of safety, and what is expected of a nuclear site Licensee. References 1and 3 to 6 are the principal documents. Other references are shown at appropriate points in the text. We have used Reference 5 as a basis to collate and analyse information collected during the interviewing.

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Exhibit 23

McGuire, Kevin and Paul Brown, *N-Plant Cuts Put Safety at Risk*, THE GUARDIAN (December 20, 1999).

Subject: [Fwd: New Leak at British Energy]
Date: Tue, 21 Dec 1999 12:20:31 -0500
From: michael mariotte <nirsnet@nirs.org>
Organization: NIRS
To: can@shaysnet.com

Subject: New Leak at British Energy
Date: Tue, 21 Dec 1999 12:14:45 -0500
From: Paul Gunter <pgunter@nirs.org>
Organization: NIRS
To: nirsnet@nirs.org

N-plant cuts put safety at risk
The Guardian
by Kevin Maguire and Paul Brown

Monday December 20, 1999

Nuclear power station chiefs have been accused by government inspectors of jeopardising safety by shedding staff to cut costs. Leaked British Energy reports reveal that the privatised operator was in dispute with the state-run nuclear installations inspectorate (NII) while a series of incidents repeatedly shut down various of its eight reactors. An internal company report marked "secret" discloses that the inspectorate had demanded a halt to redundancies, complaining that too many cheaper contractors without adequate training and skills were being used to replace in-house teams.

A second British Energy paper, headed "confidential", details more than a dozen cases, including fires and a hydrogen coolant leak, that triggered shutdowns or forced managers to switch off reactors. A reactor at the Hunterston plant automatically shut down on November 9 when a gear motor caught fire.

Since the list was drawn up, faulty welding on boiler tubes in Kent's troubled Dungeness B reactor forced it to be shut down.

British Energy, which made #298m profit last year, issued a statement to the Stock Exchange this month saying unplanned shutdowns had cut production and expected revenue. Publication of the company's documents will fuel fears about the way the nuclear industry is being run since some of it was privatised.

Nuclear inspectors were alerted to the dangers of British Energy's staff cuts by problems uncovered last year at the vast Dounreay fast breeder complex in Scotland. A damning report into Dounreay, operated by the United Kingdom Atomic Energy Authority, warned that the loss of skilled personnel and their replacement by contractors posed a serious risk, and UKAEA was forced to re-employ staff it had let go.

The leaked British Energy documents suggest the privatised nuclear industry is now suffering similar problems. One company manager has admitted some staff are on duty "significantly in excess of the basic working week" and a new relationship is needed with contractors. British Energy, which was created last year by the merger of Nuclear Electric

and Scottish Nuclear, operates Britain's seven advanced gas-cooled reactors - Heysham 1 and 2, Hinkley Point B, Dungeness B, Hunterston B, Hartlepool and Torness - and the new pressurised water reactor Sizewell B, in Suffolk.

Eighteen hundred jobs have been shed since privatisation was announced in 1995, in a cost-cutting drive known as "management of change" which has reduced the workforce to 5,389.

Leaked notes of a board meeting in October show that Peter Hollins, British Energy's chief executive, and the other directors opposed 18 of the 103 recommendations made by the nuclear inspectorate, accusing the NII of being "factually wrong" on some issues.

It agreed with only 50 of the recommendations and had qualifications about another 35. But at the same time staff cuts meant some staff were working as many as seven shifts per week instead of the normal five with all the potential consequences that tired workers pose to safety standards.

The 18 NII recommendations disputed by the company in its "secret" report on how to deal with inspectorate will give cause for concern. As well as an end to planned reductions in in-house staff, the NII recommended more "mentoring" of recruits, and a list of tasks to be undertaken only by British Energy staff, as well as a review of future work loads.

The inspectors want fresh measures to ensure any contractors are as good as the people they replaced and are properly supervised. And British Energy is urged to recreate the expertise in radiation chemistry it has given up.

The NII report is to be published next month and British Energy says it had now conceded all the points made by the NII and reached agreement. Yet internal papers show that on November 3 British Energy still opposed a call to "stop the planned reduction of in-house staff numbers until it can demonstrate that the new management of change procedure will not adversely affect the safety of nuclear plants".

The drive to cut costs - including #25m from a business support review - even threatens to close visitor centres and free bus trips for school children that were once seen as vital in winning over public opinion.

The leaked table showing how stations performed during the 13 weeks from August 16 to November 14 lists a series of cases when staff were required to shut down reactors or the reactors were shut down automatically when something went wrong.

Since then Dungeness station has shut completely because of a weld defect and needs inpsectors' permission before it can reopen. This forced the company to alert the Stock Exchange that its predicted revenue may be down for this year. A senior electricity industry source claimed: "It's only a matter of time before something serious happens if we carried on like this. Stations can only operate safely if we have sufficient numbers of trained staff to carry out safety checks. "We all want British Energy to be a successful company and have raised our concerns internally, but at times it feels as if we are being ignored." Ministers remain publicly committed to selling 49 per cent of British Nuclear Fuels (BNFL), responsible for the older magnox nuclear stations and the Sellafield reprocessing plant, before the next election.

This autumn the NII responded to an increase of safety incidents at the Cumbrian site by sending in a team of 13 inspectors to check that lack

of experienced staff at BNFL was not contributing to the problem. This report is expected to be published in the next month.

The increase in the number of "incidents" and the leaked reports will heighten pressure for tougher guarantees on safety including pledges that staff will not be shed to boost profits of shareholders.

Catalogue of closures
The leaked British Energy performance table marked "confidential" for the 13 weeks from August 16 to November 14 details a series of incidents:

Sizewell B: Automatic safety shutdown of a reactor was triggered on August 14 when the coolant pumps suffered a drop in power. The problem was solved on August 17.

Dungeness B: Reactor automatically shut down on August 28 when a motor developed a fault in a boiler pump. The reactor went back on stream seven days later when the motor was replaced.

Hartlepool: Reactor output reduced on August 23 and 24, then again on October 17 for condenser tube repairs.

Heysham 1: Reactor automatically shut down on November 6 when a control rod was being changed was not returned to service for 22 hours.

Heysham 2: Reactor shut down on July 16 for turbine repairs and investigation of vibrations. Attempt to return to service on November 6 aborted during run up when blades suffered damage.
Reactor had to be shut down on October 20 within an hour of resuming after a six-week maintenance following a pilot exciter fire. A replacement was fitted and it returned to service on October 23 having remained critical.

Torness: Reactor fuel reloading on October 29 aborted after turbo-generator hydrogen cooler leak and it was shut down for repairs from November 7 to 14.

Hinkley Point B: Reactor output limited to seal a steam leak after it automatically shut down on October 2 following eight-week service. Reactor automatically shut down on October 16 for six days due to "instability" of feed system. Reactor shut down on November 10 after a hydrogen leak into the water system.

Hunterston: Reactor shut down for five days from August 12 to fix a boiler tube leak and output was limited by turbine bearing vibration.

Reactor automatically shut down on November 9 after loss of a gas circulator saw low lubricating oil pressure and a gear motor caught fire.

Dungeness B: (Since the original list was compiled.) Both reactors shut down formore than a month after faulty weld was discovered in pressurised steam pipes.

Exhibit 25

Associated Press, *Oyster Creek Nuclear Power Plant Expected to Have Layoffs* (January 15, 2000)

Subject: Oyster Creek nuclear power plant expected to have layoffs
Date: Sun, 16 Jan 2000 13:56:14 -0500
From: "Michael Mulligan" <stmshvl@together.net>
To: "Deb Katz" <can@shaysnet.com>, "Mike D" <necnp@sover.net>, <Jim_Perkins@lewnet.avcnet.org>, <sylvia.field@valley.net>, "Raymond shadis" <shadis@ime.net>, "Mike Daley" <mjd@necnp.org>, "Judy Johnsrud" <johnsrud@csrlink.net>

Oyster Creek nuclear power plant expected to have layoffs

By Associated Press, 1/15/2000 18:29

LACEY, N.J. (AP) The future owners of the Oyster Creek Nuclear Generating Station told employees that staff would be reduced by about 10 percent once the sale to AmerGen Energy Co. is complete.

The plant employs about 700 people, and will operate at least 10 years under the proposed ownership.

AmerGen Energy Inc. plans to close on the sale of the plant by spring, company spokesman Ralph DeSantis told the Asbury Park Press for Saturday's editions.

Departments unrelated to the physical operations of the plant, such as financial and human resources, will be cut, said DeSantis.

Only three departments operations, maintenance and radiological safety and health will not be affected by layoffs.

DeSantis said staff reductions were necessary because many of the same duties performed by plant personnel are handled by AmerGen's Mid-Atlantic Regional Operations Group in Wayne, Pa.

Once the sale is approved, the Oyster Creek plant will join other plants in Pa., such as Limerick, Peach Bottom and Three Mile Island Unit I, under the same regional operations group.

Lacey Mayor John C. Parker said he was sure news of the planned layoffs had spread throughout the town. Employees were notified on Friday.

"In a town like this, you have neighbors that care about one another and know that we've got roughly 300 families in Lacey that work there and that can be hard hit by what goes on there," Parker said. "We all react to news like this, whether it affect us personally or not because that's the kind of town this is."

However, Parker added that town officials were pleased AmerGen plans to keep the plant open.

GPU had planned to shut down the 30-year-old plant in the fall of 2000 if a buyer was not found.

AmerGen agreed to buy the plant last year for $10 million.

The sale of the plant still needs approval by the Federal Energy Regulatory Commission, the federal Nuclear Regulatory Commission and the state board of public utilities.

AmerGen, founded in 1997, is a joint venture of PECO Energy Co. and British Energy Co.

Exhibit 26

Strawley, George (Associated Press), *Three Mile Island To Hire Outside Security Company* (January 15, 2000).

The Associated Press State & Local Wire

View Related Topics

January 15, 2000, Saturday, PM cycle

SECTION: State and Regional

LENGTH: 385 words

HEADLINE: Three Mile Island to hire outside security company

BYLINE: By GEORGE STRAWLEY, Associated Press Writer

DATELINE: HARRISBURG, Pa.

BODY:

The new owners of the Three Mile Island nuclear plant expect to "outsource" security operations to a Florida-based company starting next month, a spokesman said.

Wackenhut Corp., a security company that guards other nuclear plants including the Limerick and Peach Bottom plants in Pennsylvania, will give first consideration to the plant's current security workers in filling jobs, said plant spokesman Ralph DeSantis.

The workers will also receive severance packages from AmerGen, which took over ownership of the plant's Unit 1 reactor from GPU Inc. last month, DeSantis said.

"We expect that Wackenhut will continue to meet the high standards that we have," he said.

The Nuclear Regulatory Commission sets standards meant to protect all nuclear plants against terrorism, sabotage and other threats, and DeSantis said most U.S. plants hire contractors for their security. NRC rules also prevent plants from disclosing the size or other details of their security forces.

However, the chairman of a watchdog group monitoring Three Mile Island worried that unique characteristics of the plant may trouble an outside company.

"I'm not sure they have any experience with this particular facility," said Eric Epstein of Three Mile Island Alert. "There's a learning curve associated with any nuclear generating facility."

Three Mile Island's Unit 2 was the site of the nation's worst commercial nuclear accident in 1979, when a portion of the reactor's core melted. The unit has not operated since and remains the property of prior owner GPU Inc.

The island was also the scene of a security breach in 1993. A man rammed his station wagon through a fence and metal garage door at the plant and roamed a turbine building for four hours before being tracked down and arrested.

A report afterward by NRC investigators generally endorsed actions taken by the security detail.

AmerGen is a partnership formed in 1997 by Philadelphia-based PECO Energy Co. and British Energy of Edinburgh, Scotland. The company paid $23 million for the facility and $77 million for fuel over five years.

DeSantis said Friday he was not aware of any significant downsizing of the security force. Company officials said when the plant changed hands that an undefined number of its 700 jobs would be cut.

LANGUAGE: ENGLISH

LOAD-DATE: January 16, 2000

Exhibit 27

Hamilton, Robert, *NU Offers Early Retirement as a Way to Cut Work Force*, NEW LONDON DAY (October 9, 1999).

Subject: This is just the beginning
Date: Sat, 09 Oct 1999 09:40:09 -0400
From: Rosemary & Sal / Citizens Awareness Network <rbassilakis@snet.net>
To: (Recipient list suppressed)

NU offers early retirement as way to cut work force

By ROBERT A. HAMILTON
Day Staff Writer

Waterford — Northeast Utilities on Friday announced an early-retirement program at its Millstone nuclear power complex in an effort to trim 10 percent of its work force by the end of the year.

In a memo distributed Friday to Millstone employees, NU's chief nuclear officer Lee Olivier said the utility must cut staffing at the nuclear plants as it prepares for electric industry restructuring and the eventual auction of the Millstone plants.

"We believe this program will move us nearer to where we need to be in terms of future staffing levels," Olivier said. The company has said it hopes to achieve its staffing cuts entirely through voluntary separations and anticipates the early retirement could affect about 200 workers.

The offer will be open to anyone 55 or older who has worked at the plant for at least 10 years. Anyone whose age and years of service add up to 85, including three years that will automatically be added to their total, will qualify for full benefits that would normally be paid only to those 65 or older.

In addition, the program will offer "bridge" payments of $550 a month for anyone who is younger than 62, to augment his or her income until the worker is eligible for Social Security.

"We're at about 2,000 employees now, and we want to get it down to around 1,800," said Terrence McIntosh, a Millstone spokesman. "If you're eligible, you don't have to take it, but I would imagine that if you're eligible you will consider it."

The last time the company offered Millstone employees an early-retirement program was in 1995. The company's stock closed Friday at $20.56, up $1.88 for the day, on a volume of 1.5 million shares traded, about five times its normal activity. It was the first time NU stock has closed above $20 in almost four years, when its nuclear problems were first

becoming apparent.

Last fall, the company announced that it would seek to trim the number of positions at Millstone, although initially it did not set any goals. At the time, the company employed about 2,000 people directly and more than 1,000 others as contractors. The company had said that as efforts to restart the plants drew to a close, not as many people would be needed.

For much of the last few years all three plants have been out of service as the company addressed safety concerns raised by federal regulators. Last year, NU decided it would cost more to bring Millstone 1 back into service than it would be worth and chose to decommission it; Millstone 3 was restarted last year, and Millstone 2 was brought back this year.

Since the spring, Millstone has cut about 400 contractor positions, bringing the total to about 730, McIntosh said. The early retirement program represents the first significant effort to cut the direct employee numbers.

"It goes along with our Focus99 program, which we talk about as preparing us for competition," he said.

McIntosh said the early retirement program, on top of the contractor cutbacks, will not have any effect on the safety of Millstone.

"It's not going to affect plant operations whatsoever," McIntosh said. "It's just going to make us a more efficient plant heading into competition, but we can't allow competition without safety."

A rough outline of the program was announced by NU Chairman Bruce Kenyon to the company's top executives during a senior leadership meeting Thursday in Norwich, and then to employees in a memo distributed at the plant Friday.

"Based on our evaluation, we determined that this early retirement program is in the best interest of our employees, shareholders, and Millstone," the memo said.

Under the terms of the program, anyone accepting early retirement would not be eligible for severance benefits, could not be hired by an NU system company for at least 12 months, and will have to agree to a retirement date set by the company, some time between Feb. 1 and Dec. 1 of next

year. The company will also offer lump-sum payments of the enhanced benefits for people under 62.

To send an e-mail to Robert A. Hamilton, write to R.Hamilton@newlondonday.com.

Rosemary Bassilakis & Sal Mangiagli
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Exhibit 29

Lochbaum, David, *Availability and Adequacy of Design Bases Information* (submitted to) Vermont State Nuclear Panel (August 19, 1998)

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CT: 54 Old Turnpike Road, Haddam, CT 06438 P/F: 860-345-8431
VT: C/O Box 566 Putney, VT 05346 P/F: 802-387-4050
NH: 9 Evens Road, Madbury, NH 03820 P/F 603-742-4261
NY: 924 Burnet Ave. Syracuse. NY 13203 315-472-5478/ 7923

CITIZENS AWARENESS NETWORK

August 19, 1998

Vermont State Nuclear Panel
Re: Vermont Yankee Nuclear Power Station

Comments by David Lochbaum, Union of Concerned Scientists

Availability and Adequacy of Design Bases Information

In late 1995 and early 1996, discoveries were made at the Millstone Power Station in Connecticut that forced Unit 1, then Unit 2, and then Unit 3 to shut down to repair problems with safety equipment. NRC inspectors concluded that Millstone had failed to maintain and operate the units within their design and licensing bases.

On October 9, 1996, the NRC required all nuclear plant owners (except Millstone) to provide a written response under oath or affirmation within 120 days describing the administrative programs and controls they had in place that guarded against their plants operating outside their design bases. All nuclear plant owners, including Vermont Yankee, responded during early 1997.

The NRC conducted a design inspection at Vermont Yankee later during 1997 and discovered significant problems with the Residual Heat Removal System, a vital emergency system at the plant. Subsequently, Vermont Yankee committed to the NRC that it would accelerate its ongoing program to fully document the design bases for emergency systems at the plant.

During 1998, several NRC reports strongly suggest that Vermont Yankee's owners still may not have adequate assurance that the plant is operating within its design bases. The following examples illustrate this concern/

1. Torus Vent System Problem

> According to NRC Daily Event Report No. 34144 dated April 28, 1998, "...a recent NRC Bases for Maintaining Operation (BMO) inspection led to the conclusion that operation with the Vermont Yankee torus hardened wetwell vent system constituted a condition which could have prevented the fulfillment of the ability of the primary containment to control the release of radioactive material."

In other words, the NRC found that the primary containment might not be able to perform its nearly exclusive role of controlling the release of radioactive material to the environment following an accident. This problem had been detected earlier by Vermont Yankee personnel, but:

> "The licensee did not report this finding to the NRC because they thought that the EOPs [emergency operating procedures] took then outside the design basis of the plant. During a recent NRC BMO inspection, NRC inspectors concluded that this finding should have been reported to the NRC because a design basis loss of coolant accident is within the design basis of the plant."

In other words, Vermont Yankee personnel failed to properly report this problem to the NRC because they had not accurately understood the plant's design bases. The plant has been operating for 25 years, yet its design bases is not yet fully understood.

2. Torus Vent Valves Unlocked and Open

According to NRC Daily Event Report No. 34506 dated July 15, 1998, "a design basis analysis loss of coolant accident will lead to implementation of containment flooding. Rupture of the [torus vent rupture] diaphragm would have admitted torus water to the torus vent system drain valves [which had been found open when they are supposed to be locked closed] and allowed water to leak out of primary containment."

In other words, the mispositioned valves could have allowed contaminated water to leak out of primary containment following an accident. This problem had been detected earlier by Vermont Yankee personnel, but according to NRC Morning Report No. 1-98-0037 dated July 15, 1998:

> "...the event occurred one month ago, on June 14, 1998. At that time, the [plant] was in power escalation following the refueling outage, and reactor power was approximately 30 percent. The condition was not considered to be reportable at that time, because both primary and secondary containment had remained intact." Eventually, the "report was made because the open drain valves would have allowed water to leak out of the primary containment during this scenario, thereby violating the FSAR functional requirements for containment."

In other words, Vermont Yankee personnel failed to properly report this problem to the NRC because they had not accurately understood the plant's design bases. The plant has been operating for 25 years, yet its design bases is not yet fully understood.

3. Unsupported Operation for River Temperatures Over 45 Degrees

According to NRC Daily Event Report No. 34506 dated July 15, 1998, "a calculation does not exist to support the following condition: shifting service water discharge to the cooling tower deep basin for a pipe break downstream of service water valve 18 (reactor building discharge isolation) with river temperatures >45°F per FSAR section 10.6.6."

In other words, the plant may have operated in the past under unanalyzed conditions (i.e., outside of its design bases.)

These cases are troubling because they occurred after Millstone, after the NRC alerted all nuclear plant owners to the Millstone design bases problems, and after Vermont Yankee's owners told the NRC, under oath or affirmation, that they had adequate programs in place to assure that the plant operated within its design bases. Yet, two of these events indicate that Vermont Yankee personnel did not realize that the plant had been operating outside its design

Exhibit 30

Citizens Awareness Network, Nuclear Information and Resource Service, Union of Concerned Scientists, and New England Coalition on Nuclear Pollution, *Letter to William Sherman*, Vermont State Nuclear Engineer (November 15, 1998)

MA: Box 83 Shelburne Falls, MA 01370
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NH: 9 Evens Road, Medbury, NH 03820 P/F 603-742-4261
NY: 924 Burnet Ave. Syracuse. NY 13203 315-472-6478/ 7923

CITIZENS AWARENESS NETWORK

November 15, 1998

Mr. William Sherman
Vermont State Nuclear Engineer
Vermont Department of Public Service
112 State Street Drawer 20
Montpelier, VT 05620-2601

Dear Mr. Sherman,

It has come to our attention that serious cracking in Vermont Yankee nuclear power station's secondary containment concrete foundation walls has occurred. This raises health and safe concerns regarding the extent of the cracking, adequacy of the repair and structural integrity of the containment building. It is essential that all questions be resolved before Vermont Yankee receives approval for its license amendment to re-rack its fuel pool to increase irradiated fuel storage capacity. We are asking your assistance in this matter. In addition, we are requesting that issue be addressed and explored by the Vermont State Nuclear Panel. We will request that NRC address these questions and others raised regarding compliance with FSAR requirements as well.

Background

A former Vermont Yankee worker stated that there are a large number of cracks in the reactor building's secondary containment concrete walls. These cracks, some of which have been described as being nearly 25 feet long and nearly two inches wide were, as reported, repaired using an epoxy or similar sealant prior to 1982. The following questions representing the concerns of the signatories to this letter were compiled by CAN.

Questions:

1. Vermont Yankee was licensed for 40 years of operation. The reactor building's walls, which form part of secondary containment and support the structure containing the fuel pool, were designed and built to last the entire operating period of the plant.

a. Does the sealant used to repair these cracks have a service lifetime of 40 years?

b. If so, can we see the documentation for the service conditions (temperature, pressure, humidity, and radiation) associated with that lifetime?

c. If not, does Vermont Yankee have an inspection program to examine the sealant condition and replace it before the end of its service lifetime?

d. If the repairs were made after the plant received its operating license, where is the 50.59 safety evaluation for the change to the facility as described in the Final Safety Analysis Report?

e. Were any of the cracks determined to constitute through-wall penetrations in the reactor secondary containment wall or interior walls?

f. If the answer to 1.e. is "yes", was the fire resistance quality of the epoxy fill determined and a fire analysis considered before application?

f. If the answer to 1.e. is "yes", does the epoxy sealant's fire resistance rating provide an equivalent level to that of the concrete walls that are being sealed?

g. If the answer to 1.e. is "yes", was the fire resistance quality of the epoxy fill determined and a fire analysis considered before application? IF NOT, WHY NOT?

2. During a pre-decisional enforcement conference earlier in 1998, the Vermont Yankee licensee conceded that its design bases program lacked rigor and that it was "beefing" it up.

a. Has VY's design bases program captured the as-built condition of the secondary containment walls?

b. Does VY's configuration management program reflect that there are extensive cracks in the secondary containment walls plugged by sealant?

c. If the answer to (b) is no, doesn't it mean that any activity which relied on or could possibly affect secondary containment integrity may be invalid?
d. Has this technique been used before at other sites and with what success?

3. What is the complete document history of the cracks both within VY and the NRC from construction to this day?

a. Has Vermont Yankee mapped and documented cracking in secondary containment structures with the Nuclear Regulatory Commission? If not, why not?

b. Has Vermont Yankee determined if any of the structural walls experiencing cracking are load-bearing structures? Has a safety evaluation report been completed on structural walls with cracking?

c. Has a cause for the cracking been determined and where is this determination documented?

d. What is the date of the most recent inspection of the entire structure?

e. Since repair of the cracks, has a determination been made of whether the progress in the rate of cracking is accelerating, slowed, or stopped? Has Vermont Yankee observed continued or ongoing cracking? If yes, please provide documentation of evaluations pertaining to the crack growth rate.

f. What impact does temperature differential of the inner and outer wall surfaces have on the cracking?

We are concerned that this cracking potentially could reveal serious omissions in Vermont Yankee's FSAR which is relied upon for safe operation of the reactor. Additionally, Vermont Yankee's request for increased fuel pool storage capacity, requires a determination as to whether any factors germane to this modification could have any impact on the cracking in the containment structures walls or the cause of the cracking before NRC approval. In the interests of safety and economics , we believe that state's involvement in this investigation is essential.

We appreciate your timely attention in this matter.

Sincerely,

Deb Katz
President
Citizens Awareness Network

Dave Lochbaum
Nuclear Engineer
Union of Concerned Scientist

Michael Mulligan
Board Member
New England Coalition on Nuclear Pollution

Paul Gunter
Director Reactor Watch Dog Project
Nuclear Information and Resource Service

Exhibit 31

Lochbaum, David, *Review of the NRC SALP For Vermont Yankee* (September 4, 1998).

Subject: Comments on Vermont Yankee SALP
Author: Dave Lochbaum
Date: 9/4/98 12:23 PM

I reviewed the Vermont Yankee SALP report issued by the NRC on Augsut 28, 1998, and have the following comments:

1. In the transmittal letter, the NRC commended VY for senior management involvement that resulted in improvements to plant performance. According to NRC, "Particularly noteworthy was management's implementation of the Configuration Management Improvement Project, which improved identification of design and licensing issues."

In reality, this apparent positive is a negative. Had management at VY been doing its job all along, there would not have been such a dire need for improvement at the facility.

Additionally, this NRC summary curiously omits several key facts. For example, on October 9, 1996, the NRC sent VY a letter demanding that VY review the adequacy and availability of design information. VY responded under oath or affirmation in early 1997 that it had everything under control. In summer 1997, an NRC design inspection team found significant problems with the residual heat removal system at VY and concluded that VY would have not been able to find these design problems. It was only after the enforcement conference to discuss these violations that VY accelerated the pace of its configuration management improvement project. Thus, VY's management is reactive rather than pro-active. *Pro-active management is good. Reactive management is not so good.*

2. Section II of the SALP report rated the Operations Area at VY as 2 . The NRC stated that "Operators performance in response to abnormal conditions and plant transients was also very good with few exceptions."

The SALP report stated that "operator follow-up actions complicated the recovery" from a reactor scram in June 1998. In addition, "Placing two 'down-scale' average power range monitors (APRMs) in service, and poor coordination of switchyard activities are two examples of human performance errors that led to reactor scrams."

According to the NRC's NUREG-1272 Vol. 9 No. 1, the average BWR plant experienced 1.81 reactor scrams in 1991, 1.78 in 1992, 1.62 in 1993, 1.41 in 1994, and 1.46 in 1995. Roughly one-third of these reactor scrams were manually initiated for planned outages.

VY had at least two (2) reactor scrams caused by operator error during this SALP period and another reactor scram was complicated by operator error. VY had more reactor scrams casued by operator error than the average BWR plant had caused by all reasons.

In addition, the NRC stated that VY operations took 14 days to make a 4-hour report of a problem to the NRC. This is not performance that is "very good with few exceptions."

3. Section IV of the SALP report rated the Engineering Area as 2. The NRC stated that "engineering personnel were knowledgeable.:

By letter dated August 27, 1997, the NRC staff transmitted Design Inspection Report 50-271/97-201 to Vermont Yankee. The transmittal letter stated that "the team concluded that it was unlikely that [Vermont Yankee personnel] would have uncovered some of the issues identified in this report."

That design inspection report documented serious design problems with the residual heat removal system. Given that the NRC thought that VY staff could not uncover serious design problems, it is not apparent that a 2 rating is justified.

4. Section V of the SALP report rated the Plant Support Area as 2.

The NRC reported they found "ineffective radiological oversight of work," "insufficient radiation protection staffing," "notable performance deficiencies," and "radiological briefings of workers conducted prior to the start of work were ineffective."

The NRC reported that "senior licensee management suspended work" during the recent refueling outage after the NRC identified numerous radiation protection problems to them.

After resuming work, the NRC reported that poor planning and execution "caused some airborne radioactive materials to be exhausted into the reactor building."

If these misadventures represent "Good" performance, what would be "bad" performance. The NRC had to step in and force VY management to correct serious problems during the outage. That is NOT goo d performance on VY's part.

The NRC must have graded VY using a very generous curve. I cannot understand operators can cause more reactor scrams than the industry experiences and get a "Good" rating or how Engineering can be incapable of finding design problems and get a "Good" rating or how Plant Support cannot self-identify radiation protection problems and get a "Good" rating. Using the same grading system, I'd assess NRC's performance on this SALP report as "Good."

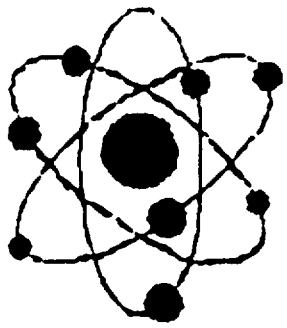
Dave Lochbaum
Union of Concerned Scientists

Exhibit 32

Riccio, James, *Amnesty Irrational How the Nuclear Regulatory Commission Fails To Hold Nuclear Reactor Accountable for Violations of Its Own Safety Regulations*, PUBLIC CITIZEN (August 1999)

Amnesty Irrational

HOW THE NUCLEAR REGULATORY COMMISSION FAILS TO HOLD NUCLEAR REACTORS ACCOUNTABLE FOR VIOLATIONS OF ITS OWN SAFETY REGULATIONS



JAMES P. RICCIO

Public Citizen

CRITICAL MASS ENERGY PROJECT
215 PENNSYLVANIA, AVE, SE
WASHINGTON, DC 20003

AUGUST 1999

EXECUTIVE SUMMARY

The design basis of a nuclear reactor is the starting point of all regulation. It is the safety and operational blue print for the nuclear reactor. If a reactor is operating "outside design basis" it is impossible for the Nuclear Regulatory Commission (NRC) or the utility to determine whether the reactor is "safe" or whether its operation poses an undue risk to public health and safety. Operating a reactor "outside design basis" constitutes a violation of NRC regulations.

If a utility has operated the reactor outside of the safety parameters established in its operating license, i.e. "outside design basis," it is required to document it in a daily event report filed with the NRC. The more event reports filed by a nuclear reactor, the less certain that the reactor and its safety systems will operate as designed.

Nuclear reactors across the United States have reported to the NRC that they have been splitting atoms while "outside design basis" and in violation of the terms and conditions of their operating licenses. Public Citizen has documented which reactors have most often reported operating while "outside design basis." From October 1996 through May 1999, 102 of 111 nuclear reactors have reported over 500 instances where they have been splitting atoms while "outside design basis."

Event reports filed with the NRC indicate that reactors operating "outside design basis" have undermined the NRC's regulatory philosophy of defense-in-depth. Rather than having multiple, redundant barriers to the release of radiation, i.e. defense-in-depth, reactors have failed to maintain their design basis for such safety significant systems as the emergency core cooling system and the electrical cables that control the nuclear reactor. Additionally, failure to maintain the design basis has led to instances where defense-in-depth has been so thoroughly undermined that a single event or condition could have prevented the functioning of safety systems needed to: shutdown the reactor, cool the radioactive fuel in the reactor core, prevent the release of any radiation into the environment or otherwise mitigate the consequences of an accident.

Many design basis problems have existed for years, if not decades. Some design basis problems date back to when the reactors were first licensed. Design basis deficiencies have reduced safety margins at nuclear reactors across the United States; in some cases safety margins were significantly reduced if not eliminated. However, every time the NRC has moved to address the problem, the nuclear industry lobby has intervened to block any meaningful attempt to correct inadequacies in the design basis of nuclear reactors.

Even before the NRC had documented the extent of the design basis problems in the nuclear industry, the regulator decided that nuclear reactor licensees would not be held accountable for violating NRC regulations. The NRC has re-written its enforcement policy to create an amnesty program that will last until March 30, 2001.

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The NRC's amnesty program has severely circumscribed its ability to take enforcement action (issuing a fine and or violation) against nuclear utilities that have failed to maintain the design basis of their nuclear reactors. This amnesty means that the NRC will only hold utilities accountable for the most egregious violations of NRC regulations.

The U.S. Nuclear Regulatory Commission has long been aware that nuclear utilities have failed to adequately maintain their design basis and as a consequence, have operated their reactors "outside design basis" and in violation of the terms of their licenses. Over a span of decades, the NRC was repeatedly put on notice that design basis problems were under-mining the safety of the nuclear reactors they were supposed to regulate. However, due to the potential financial impact on the nuclear industry, the NRC has obfuscated the issue and delayed taking action.

Design basis issues have already contributed to the closure of three nuclear reactors: Haddam Neck, Maine Yankee and Millstone Unit 1. Public Citizen has found that several of the design basis issues that contributed to the closure of Haddam Neck, Maine Yankee and Millstone Unit 1 exist at other nuclear reactors.

The design basis issues that eventually resulted in these shutdowns were not identified by the utility. These problems only came to light when driven by events, whistleblower allegations or subsequent NRC inspections. The NRC design inspections turned up significant safety problems; however, the efficacy of these inspections must be questioned. NRC did not inspect the "as found" conditions of the nuclear reactors. The NRC warned the utilities which systems would be inspected and the utilities worked the systems prior to NRC inspection.

The NRC can not reasonably expect the utility to identify design basis problems that would jeopardize future operation of the reactor. The NRC's amnesty program is an irrational move by an ineffective regulator and will not address the significant design basis issues that still exist at nuclear reactors across the United States.

INTRODUCTION

Nuclear utilities across the United States have been reporting to the Nuclear Regulatory Commission that their reactors have been splitting atoms while "outside design basis" and in violation of the terms and conditions of their operating licenses. Rather than hold these utilities accountable, the NRC instituted an amnesty program in October 1996. This amnesty program means that utilities will only be held accountable for the most egregious violations of NRC regulations

Since that time, Public Citizen has been documenting which reactors have most often operated while "outside design basis." From October 1996 through May 1999, 102 of 111 nuclear reactors have reported over 500 instances where they have been operating "outside design basis." However, if a nuclear reactor is splitting atoms while "outside design basis" neither the NRC nor the utility can determine whether that operation is safe or poses an undue risk to public health and safety.

Public Citizen's report identifies those reactors that have most often operated outside of their design basis and documents how the nuclear industry and the NRC have ignored this important safety issue for decades.

I. FINDINGS

The U.S. Nuclear Regulatory Commission (NRC) is charged with assuring that the public health and safety are protected from the consequences of a nuclear reactor accident. The NRC contends that if a nuclear reactor is designed, constructed and operated in compliance with its approved design, then the redundant safety systems built into the plant will provide an adequate level of safety even if one of the safety systems should fail and an accident were to occur. According to the NRC, the redundant safety systems built into the reactor will prevent the release of radiation into the environment and surrounding communities.

The design basis of a nuclear reactor is the starting point of all NRC regulation. It is the safety and operational blue print for the nuclear reactor. If a reactor is operating "outside design basis" it is impossible for the NRC or the utility to determine whether the reactor is "safe" or whether its operation poses an undue risk to public health and safety. Operating a reactor "outside design basis" constitutes a violation of NRC regulations. If a utility has operated the reactor outside of the safety parameters established in its operating license, i.e. "outside design basis," it is required to document it in a daily event report filed with the NRC. The more event reports filed by a nuclear reactor, the less certain that the reactor and its safety systems will operate as designed.

Operating nuclear reactors outside their design basis has reduced, if not eliminated safety margins at many reactors across the United States. However, the NRC has failed to hold nuclear reactors accountable for these violations. Rather than holding nuclear utilities responsible for failing to comply with their design basis and violating NRC regulations, the NRC issued an amnesty program in October 1996 that will last until March 30, 2001.

Public Citizen has scoured the daily event reports filed over the past three years of NRC amnesty program documenting those reactors that have reported operating "outside design basis." Over the past three years 102 of 111 nuclear reactors have reported over 500 times that they have been splitting atoms while "outside design basis." The NRC has attempted to down play the significance of this problem that they and the nuclear industry have ignored for decades. This amnesty program means that the NRC will only hold utilities accountable for the most egregious violations of NRC regulations. The NRC policy is not sound regulatory practice, its Amnesty Irrational!

Item Number: C9010

Public Citizen is a nonprofit membership organization in Washington, D.C., dedicated to advancing consumer rights through lobbying, litigation, research, publications and information services. Since its founding by Ralph Nader in 1971, Public Citizen has fought for consumer rights in the marketplace, for safe and secure health, for fair trade, for clean and safe energy sources, and for corporate and government accountability. Critical Mass Energy Project is its energy policy group.

Public Citizen
215 Pennsylvania Avenue, SE
Washington, DC 20003

Other titles by
The Critical Mass Energy Project:

Dammed Deregulation:
How Deregulation of the Electric Power Industry Could Affect the Nation's Rivers
Green Buyers Beware: A Critical Review of "Green Electricity" Products
Questioning the Authority
A Roll of the Dice: NRC's Efforts to Renew Nuclear Reactor Licenses
Abuse of Discretion: NRC's Non-Enforcement Policy

TABLE I

REACTORS REPORTING "OUTSIDE DESIGN BASIS" 1996 -1999

Reactor	Unit #	Owner	State	Reports Number
VERMONT YANKEE	1	VT Yankee Nuclear Power Corp.	VT	42
PILGRIM	1	Boston Edison Co.	MA	27
THREE MILE ISLAND	1	GPU Nuclear Corp.	PA	26
COOK	2	Indiana/Michigan Power Co.	MI	22
COOK	1	Indiana/Michigan Power Co.	MI	18
POINT BEACH	1	Wisconsin Electric Power Co.	WI	18
POINT BEACH	2	Wisconsin Electric Power Co.	WI	18
MILLSTONE	1	Northeast Nuclear Energy Co.	CT	16
OYSTER CREEK	1	GPU Nuclear Corp.	NJ	16
MILLSTONE	3	Northeast Nuclear Energy Co.	CT	16
PRAIRIE ISLAND	1	Northern States Power Co.	MN	14
CATAWBA	2	Duke Power Co.	SC	14
DIABLO CANYON	2	Pacific Gas & Electric Co.	CA	14
NINE MILE POINT	2	Niagara Mohawk Power Corp.	NY	14
HADDAM NECK	1	Northeast Nuclear Energy Co.	CT	13
PRAIRIE ISLAND	2	Northern States Power Co.	MN	13
OCONEE	3	Duke Power Co.	SC	12
DIABLO CANYON	1	Pacific Gas & Electric Co.	CA	11
OCONEE	2	Duke Power Co.	SC	11
CATAWBA	1	Duke Power Co.	SC	10
DAVIS-BESSE	1	Toledo Edison Co.	OH	10
NINE MILE POINT	1	Niagara Mohawk Power Corp.	NY	10
OCONEE	1	Duke Power Co.	SC	10
PALISADES	1	Consumers Power Co.	MI	10
INDIAN POINT	3	Consolidated Edison Co.	NY	10
INDIAN POINT	2	Consolidated Edison Co.	NY	9

(NOTE: the entire list is contained in Appendix A. The entire text for each report may be view on the Critical Mass Web site @ http://www.citizen.org/cmep/AI/Default.htm)

Since NRC began its amnesty program, the nuclear reactors listed in Table I have filed the greatest number of event reports with the Commission indicating that they operated "outside design basis." The more event reports filed by a reactor the less certain that the nuclear plant and its safety systems will function as designed.

Table II indicates those nuclear plants that have most often operated their reactors "outside design basis" and in violation of NRC regulations. Nuclear plants have between one and three reactors or units located at the same site. For instance, the Cook nuclear plant consists of two reactors, Unit 1 and 2.

TABLE II

"OUTSIDE DESIGN BASIS" BY NUCLEAR PLANT 1996-1999

Reactor	Owner	State	Event Reports
VERMONT YANKEE	VT Yankee Nuclear Power Corp.	VT	42
MILLSTONE	Northeast Nuclear Energy Co.	CT	35
PILGRIM	Boston Edison Co.	MA	27
THREE MILE ISLAND	GPU Nuclear Corp.	PA	26
NINE MILE POINT	Niagara Mohawk Power Corp.	NY	24
COOK	Indiana/Michigan Power Co.	MI	23
POINT BEACH	Wisconsin Electric Power Co.	WI	20
INDIAN POINT	Con-Edison Co./ NYPA	NY	19
OYSTER CREEK	GPU Nuclear Corp.	NJ	16
PRAIRIE ISLAND	Northern States Power Co.	MN	16
DIABLO CANYON	Pacific Gas & Electric Co.	CA	14
CATAWBA	Duke Power Co.	SC	14
OCONEE	Duke Power Co.	SC	13
HADDAM NECK	Northeast Nuclear Energy Co.	CT	13
PALISADES	Consumers Power Co.	MI	10
DAVIS-BESSE	Toledo Edison Co.	OH	10

(NOTE: The entire listing arranged by nuclear plant is contained in Appendix B. Appendix C contains an accounting of all "outside design basis" event reports.)

The more than 500 event reports documented by Public Citizen all concern design basis issues. More than 70 additional reports of reactors operating "outside design basis" were filed with NRC and later retracted by the utility. However, retracted does not mean there wasn't a problem. Event reports have been retracted because utilities have either made "quick fixes," removed the documentation from the final safety analysis reports, or have amended the terms of their license. Other reports were retracted because the utilities originally mischaracterized the nature or extent of the problem that they thought placed the reactor "outside design basis."

Table III lists those few nuclear reactors that have not reported splitting atoms while "outside design basis." However, the NRC has identified that Fermi Unit 2 and both of the LaSalle reactors have failed to update their final safety analysis reports (FSAR). While failure to update the FSAR does not necessarily result in the reactor operating outside of its design basis, it does mean that these reactors have been making safety decisions based upon incomplete or inaccurate information.

TABLE III
REACTORS NOT REPORTING "OUTSIDE DESIGN BASIS"

Reactor	Unit #	Owner	State
ARKANSAS	1	Entergy Operations, Inc.	AR
FERMI	2	Detriot Edison Co.	MI
HATCH	2	Southern Nuclear Operating Co.	GA
LA SALLE	1	Commonwealth Edison Co.	IL
LA SALLE	2	Commonwealth Edison Co.	IL
PALO VERDE	3	Arizona Public Service Co.	AZ
RIVER BEND	1	Entergy Operations, Inc	LA
WASHINGTON NUCLEAR	2	Washington Public Power System	WA
WATTS BAR	1	Tennessee Valley Authority	TN

"Outside design basis" event reports filed by utilities indicate that serious problems with safety systems have existed for years, if not decades. These reports indicate that reactors operating "outside design basis" have undermined the NRC's regulatory philosophy of "defense-in-depth." Rather than having multiple, redundant barriers to the release of radiation, i.e. defense-in-depth, reactors have failed to maintain their design basis for significant safety systems such as the emergency core cooling system and the electrical cables that control the nuclear reactor.

Additionally, failure to maintain the design basis has led to instances where defense-in-depth has been so thoroughly undermined that a single event or condition could have prevented the functioning of safety systems needed to: shutdown the reactor, cool the radioactive fuel in the reactor core, prevent the release of any radiation into the environment or otherwise mitigate the consequences of an accident.

Although not every design basis issue is of high safety significance, a preliminary review by the NRC's now defunct Office of Analysis and Evaluation of Operational Data (AEOD) conducted in June 1997 found that:

- 34% of all event reports contained design basis issues.
- 42% of these events involved four risk significant systems: emergency core cooling, primary reactor systems, emergency ac/dc power and containment isolation.
- 29% of event reports were judged by AEOD to be significant.

Design basis issues have already contributed to the closure of three nuclear reactors: Haddam Neck, Maine Yankee and Millstone Unit 1. The design basis issues that eventually resulted in these shut downs were not identified by the utility. These problems only came to light when driven by events, whistleblower allegations or

Exhibit 33

Citizens Awareness Network, Letter to the Vermont State Nuclear Advisory Panel, re: *Core Shroud Inspection and Flaw Evaluation* (June 19, 1996)

CITIZENS AWARENESS NETWORK [illegible]

TELEPHONE/ FAX: 413-339-8768

June 19, 1996

Vermont State Nuclear Advisory Panel
Department of Public Service
112 State street Drawer 20
Montpelier, VT 05620-2601
Fx: 802-828-2342

Dear Members of Vermont State Nuclear Advisory Panel,

In September 1995 Citizens Awareness Network presented our concerns about the Shroud Inspection and Flaw Evaluation of the Vermont Yankee Nuclear Power Station. CAN and New England Coalition Against Nuclear Pollution called for an inspection and repair of the shroud due extensive cracking in the H5 belt-line weld in the shroud.

Background

During the last refueling outage, Vermont Yankee identified cracking in the circumferential welds in the core shroud. There was intergraunular stress corrosion cracking(ISCC) in all welds except for H7. The cracking in Weld # H5 was over 1" in depth. The shroud is 2" thick and fourteen feet high. This cracking information was ascertained through ultrasonic testing. The VY shroud was fabricated using high carbon Inconnel 304 stainless steel , and has been found at other reactors to be susceptible to ISCC. This cracking is of concern to citizens living in proximity to the reactor.

In a letter to the NRC from Vermont Yankee dated August 17, 1994 in regards to "Intergranular stress corrosion cracking of the core shrouds in BWRs" Yankee commited to inspect its core shroud during 1995 refueling outage. Yankee conducted a limited visual inspection of the core shroud in 1993. One half of the vertical weld length was inspected, 30% of the mid-cylinder weld (H-4), approximately 30% of the shroud-shroud support weld (H-7), and lesser amounts of H-1 and H-2. No cracking was detected. <u>However H-5 was not inspected. H-5 was the weld which during refueling was found to have a significant circumferential crack over 1" deep in a 2" deep shroud.</u>

In a memorandum from Yankee Atomic-Bolton dated 4/13/95 to S.R. Miller from C.B. Larsen, P.A. Phelan, and J.R. Hoffman re: VY Core Shroud Inspection And Flaw Evaluation of the stress corrosion cracking in the welds is addressed. 2/3 of the welds for H-1-H-6 were examined. Due to access constraints 1/3 of H-7 was examined. Flaws were detected in welds H-1-H-6. An analysis was done of all the welds. Given the analysis , all the weld flaws " are minor and will present no concern for many years...."**However the H-5 weld failed the testing. "Using these assumptions operation for one**

additional cycle is not permissible, based on the reported cracking in weld H-5 all other welds are acceptable for at least two additional cycles." (Quote from Yankee Atomic)

After failing the evaluation technique, an alternative analysis was performed by Yankee Atomic "to evaluate operation for one cycle using the inspection data from weld H-5" Using this alternative assumption, the H-5 weld demonstrated suitable factors of safety to justify one cycle of operation.

A meeting was held on March 13, 1996 between the NRC and representatives of the Vermont Yankee Nuclear Power Corporation at Rockville, Maryland to discuss the licensee's plans for core shroud repair and reactor vessel inspection at the VYNPS during the 1996 refueling outage.(Docket No. 50-271). At this meeting the licensee committed to repair the shroud during the 1996 refueling . "The licensee stated that it plans to install modifications to repair the core shroud at VYNPS during the 1996 refueling..... The refueling is scheduled to begin on or about August 24, 1996 and last approximately 29 days.". At this meeting VYNPS submitted core shroud flaw evaluations for welds 1-7. Of the visible portions of the H-5 weld, 11/12th appeared to be cracked. The H-4 weld had, again the in the visible portions, extensive cracking. (Evaluations for welds included in fax transmission)

The shroud repair installation will be performed by Framatome Technologies with oversight during design, fabrication, and installation by Yankee Atomic and Vermont Yankee engineering staff. An independent third party review will be performed.

Questions concerning the Shroud Repair and the Inspection of the Reactor Vessel:

- Shroud Repair and Off Loading of Fuel:
    1. Will the repair of the shroud require the off-loading of all fuel from the reactor?
    2. If a full off load is required, does the licensee require an amendment to their technical specifications to do so?
    3. If an amendment is required, when did VYNPS apply for it? At the Millstone Reactor in CT, the routine full core off-loading for refueling into the fuel pool constituted a violation of their technical specifications.

- Fuel Pool:
    4. If the full core is off-loaded and placed in the fuel pool, how will that effect the pool? What is the curie count of the high-level waste in the pool?
    5. What temperature increase will occur in the pool with the off-loaded core?
    6. How will the re-racking of the pool and its high-density packing effect the full core off load and the increase in temperature in the pool?

- Radiation Doses

7. Since the shroud is a highly irradiated reactor component, what will the radiation doses to workers be from the shroud repair?
8. Will the shroud be decontaminated before repair to limit worker exposures?
9. If so, will there be releases into the water or air from the decontamination?
10. If releases are expected to occur, how many are estimated?
11. Will their be exposures to the community from the repair?

- CAN understands from NRC resident inspector Cooke that the repair will be based on the General Electric model which uses four tie rods as opposed to the ten tie rods utilized in other approaches. Why was the four tie rod system chosen rather than the ten?

- Since cast austenitic stainless steel type 304, used extensively in reactors and at YVNPS, suffers severe stress corrosion cracking, CAN is concerned that this type of steel not be used in the repair of the shroud. (At Oyster Creek nuclear power station in New Jersey, the utility repaired their shroud with type 304 and the steel has begun to crack within a few years of the repair). What type of steel will be used in the repair of the shroud?

- In addition to the inspection of the vessel, which components of the 25 systems subject to intergranular stress corrosion cracking will VY examine during this refueling? The corrosive cracking of the core shroud is in fact a indicator of the potential embrittlement and subsequent failure of these other components. Many of these components are safety related. Since the two systems that were inspected ultrasonically, the shroud support ring and shroud head bolts, showed indications of ISCC, will the other component systems be examined ultrasonically as well?

- How will an inspection of the vessel be performed? Will the vessel be examined ultrasonically?
    12. Is the vessel made from the high carbon Inconnel 304 stainless steel?
    13. Is VYNPS planning a re-annealing of the reactor vessel in the near future?

- What is the estimated cost of the repair of the shroud?

- CAN is concerned that Yankee Atomic engineering staff will provide oversight during the design, fabrication, and installation of the repair. In an NRC Inspector General's (OIG) report, Event Inquiry- Maine Yankee Power Station (Case No. 96-04S) (which is an investigation of a whistleblower's allegations concerning the possible fabrication of data for computer codes by Yankee Atomic (YAEC) for Maine Yankee(MYAPCO)), the inspector General's office uncovered ".....significant indications of possible licensee violations of NRC requirements and regulations." "The OIG developed evidence that neither MYAPCO nor YAEC reported modifications and changes to the RELAP5YA computer code and oscillatory problems experienced with the code during the 1989 to 1993 period." (They were required to do so) The OIG investigation "did not attempt to investigate the activities

of MYAPCO and YAEC. Such an investigation will be conducted by the NRC Office of Investigations." The OIG's report determined an over reliance by the NRC staff on the licensee to follow NRC requirements and regulations rather than NRC staff requiring compliance and accountability.

14. Since Yankee Atomic is under investigation by the Office of Investigation, we are asking for a full inspection by NRC staff for the repair of the shroud and the inspection of the reactor vessel and other component systems.
15. Who will be doing the independent review?
16. In addition, we request that any data to be analyze be gathered independently.

We request a written response to our questions. CAN requests that the next VSNAP meeting be held in the vicinity of the reactor allowing those citizens most affected to participate. In addition, we ask the Panel to request the NRC hold a meeting in the community to provide information to the community on the shroud repair and respond to citizens questions.

Sincerely,

Deborah Katz
President
Citizens Awareness Network

Antarctic Conservation Act of 1978. This is the required notice.

FOR FURTHER INFORMATION CONTACT: Joyce Jatko, Acting Permit Officer, Office of Polar Programs, Rm. 755, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230.

SUPPLEMENTARY INFORMATION: On December 23, 1999, the National Science Foundation published a notice in the **Federal Register** of permit applications received. A permit was issued on January 21, 2000 to Mimi Wallace, Permit No. 2000–023. A permit was issued on January 22, 2000 to Christian H. Fritsen, Permit No. 2000–024.

Joyce Jatko,

Acting Permit Officer.

[FR Doc. 00–2357 Filed 2–2–00; 8:45 am]

BILLING CODE 7555–01–M

NUCLEAR REGULATORY COMMISSION

[Docket No. 50–27]1

Vermont Yankee Nuclear Power Corporation; Vermont Yankee Nuclear Power Station; Notice of Consideration of Approval of Transfer of Facility Operating License and Conforming Amendment, and Opportunity for a Hearing

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of an order under 10 CFR 50.80 approving the transfer of Facility Operating License No. DPR–28 for the Vermont Yankee Nuclear Power Station (Vermont Yankee). The transfer would be to AmerGen Vermont, LLC (AmerGen Vermont). The Commission is also considering amending the license for administrative purposes to reflect the proposed transfer. Vermont Yankee is located in Vernon, Vermont.

According to an application for approval of the transfer and a conforming license amendment filed by the AmerGen Vermont and Vermont Yankee Nuclear Power Corporation (VYNPC), the current license holder, AmerGen Vermont would assume title to the facility following approval of the proposed license transfer, and would be responsible for the operation maintenance and eventual decommissioning of Vermont Yankee. In addition, substantially all of VYNPC's employees located at Vermont Yankee involved in operation and maintenance will assume similar roles and responsibilities for AmerGen Vermont at Vermont Yankee. No physical changes to the Vermont Yankee facility or operational changes are being proposed in the application.

AmerGen Vermont is a Vermont limited liability company established by AmerGen Energy Company, LLC (AmerGen) to own and operate Vermont Yankee. AmerGen Vermont is a wholly owned substantially of AmerGen. AmerGen is a Delaware limited liability company formed to acquire and operate nuclear power plants in the United States. AmerGen is owned by PEPCO Energy Company and British Energy, Inc.

The proposed license amendment would remove references to VYNPC in the license, add references to AmerGen Vermont, and make other administrative changes of a similar nature to reflect the proposed transfer.

Pursuant to 10 CFR 50.80, no license, or any right thereunder, shall be transferred, directly or indirectly, through transfer of control of the license, unless the Commission shall give its consent in writing. The Commission will approve an application for the transfer of a license, if the Commission determines that the proposed transferee is qualified to hold the license, and that the transfer is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

Before issuance of the proposed conforming license amendment, the Commission will have made findings required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations.

As provided in 10 CFR 2.1315, unless otherwise determined by the Commission with regard to a specific application, the Commission has determined that any amendment to the license of a utilization facility which does no more than conform the license to reflect the transfer action involves no significant hazards consideration. No contrary determination has been made with respect to this specific license amendment application. In light of the generic determination reflected in 10 CFR 2.1315, no public comments with respect to significant hazards considerations are being solicited, notwithstanding the general comment procedures contained in 10 CFR 50.91.

The filing of requests for hearing and petitions for leave to intervene, and written comments with regard to the license transfer application, are discussed below.

By February 23, 2000, any person whose interest may be affected by the Commission's action on the application may request a hearing, and, if not the applicants, may petition for leave to intervene in a hearing proceeding on the Commission's action. Requests for a hearing and petitions for leave to intervene should be filed in accordance with the Commission's rules of practice set forth in Subpart M, "Public Notification, Availability of Documents and Records, Hearing Requests and Procedures for Hearings on License Transfer Applications," of 10 CFR Part 2. In particular, such requests and petitions must comply with the requirements set forth in 10 CFR 2.1306, and should address the considerations contained in 10 CFR 2.1308(a). Untimely requests and petitions may be denied, as provided in 10 CFR 2.1308(b), unless good cause for failure to file on time is established. In addition, an untimely request or petition should address the factors that the Commission will also consider, in reviewing untimely requests or petitions, set forth in 10 CFR 2.1308(b)(1)–(2).

Requests for a hearing and petitions for leave to intervene should be served upon counsel for VYNPC, John Ritsher, at One International Place, Boston, Massachusetts, 02110 (tel: 617–951–7000; fax: 617–951–7050; e-mail: jritsher@ropesgray.com), and counsel for AmerGen Vermont, Kevin P. Gallen, at Morgan, Lewis & Bockius LLP, 1800 M Street, NW., Washington, DC 20036–5869 (tel: 202–467–7462; fax: 202–467–7176; e-mail: kpgallen@mlb.com); the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555 (e-mail address for filings regarding license transfer cases only: OGCLT@NRC.gov); and the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, Attention: Rulemakings, and Adjudications Staff, in accordance with 10 CFR 2.1313.

The Commission will issue a notice or order granting or denying a hearing request or intervention petition, designating the issues for any hearing that will be held and designating the Presiding Officer. A notice granting a hearing will be published in the **Federal Register** and served on the parties to the hearing.

As an alternative to requests for hearing and petitions to intervene, by March 6, 2000, persons may submit written comments regarding the license transfer application, as provided for in 10 CFR 2.1305. The Commission will consider and, if appropriate, respond to these comments, but such comments will not otherwise constitute part of the decisional record. Comments should be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Washington,

DC 20555–0001, Attention: Rulemakings and Adjudications Staff, and should cite the publication date and page number of this **Federal Register** notice.

For further details with respect to this action, see the application dated January 6, 2000, submitted under cover of letter dated January 6, 2000, which is available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC., and accessible electronically through the ADAMS Public Electronic Reading Room link at the NRC Web site, http://www.nrc.gov.

Dated at Rockville, Maryland this 27th day of January 2000.

For the Nuclear Regulatory Commission.

Richard P. Croteau,

Project Manager, Section 2 Project Directorate I, Division of Licensing Project Management, Office of Nuclear Reactor Regulation.

[FR Doc. 00–2429 Filed 2–2–00; 8:45 am]

BILLING CODE 7590–01–M

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Nuclear Waste; Notice of Meeting

The Advisory Committee on Nuclear Waste (ACNW) will hold its 117th meeting on February 23–25, 2000, Room 2D Large Conference, Arnold & Mabel Beckman Center of the National Academies, 100 Academy Drive, Irvine, California.

The entire meeting will be open to public attendance.

The schedule for this meeting is as follows:

Wednesday, February 23, 2000—8:30 a.m. Until 5:00 p.m.

8:30 a.m.–12:00 Noon: Self-Assessment–The Committee will conduct a self assessment. The Committee will review the goals set in its 1999 Action Plan, and compare those goals to its accomplishments. The Committee will examine steps it can take to increase its operational efficiency.

1:30 p.m.–2:30 p.m.: Guest Speaker—The Committee will hear a lecture by Dr. Stan Kaplan on the use of probability.

2:45 p.m.–5:00 p.m.: Priorities—The Committee will begin to outline possible issues for consideration in 2000 and beyond.

Thursday, February 24, 2000–8:30 a.m. Until 4:00 p.m.

8:30 a.m.–9:30 a.m.: Review Mission, Vision, Desired Outcomes, Goals and Objectives.

9:30 a.m.–10:30 a.m.: First Tier Priorities—Select First Tier Priority issues for the year 2000 Action Plan.

10:45 a.m.–12:00 Noon: Second Tier Priorities—Select Second Tier Priority issues for the year 2000 Action Plan.

1:30 p.m.–2:30 p.m.: Guest Speaker—The Committee will hear a lecture on waste minimization.

2:45 p.m.–3:30 p.m.: Operational Issues—The Committee will focus on issues to increase operational effectiveness.

3:30 p.m.–4:00 p.m.: Succession Planning—The Committee will focus on succession planning for members and staff over the next five years.

Friday, February 25, 2000–8:30 a.m. Until 3:00 p.m.

8:30 a.m.–10:30 a.m.: ACNW Planning and Procedures—The Committee will consider topics proposed for future consideration by the full Committee and Working Groups. The Committee may also discuss ACNW-related activities of individual members.

10:45 a.m.–2:30 p.m.: Preparation of ACNW Reports—The Committee will discuss planned reports on the following topics: NRC's proposed high-level waste regulation, the Defense-in-Depth philosophy, the release of solid material (tentative), and the Department of Energy's Yucca Mountain specific siting guidelines (tentative).

2:30 p.m.–3:00 p.m.: Miscellaneous—The Committee will discuss miscellaneous matters related to the conduct of Committee and organizational activities and complete discussion of matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

Procedures for the conduct of and participation in ACNW meetings were published in the **Federal Register** on September 28, 1999 (64 FR 52352). In accordance with these procedures, oral or written statements may be presented by members of the public, electronic recordings will be permitted only during those portions of the meeting that are open to the public, and questions may be asked only by members of the Committee, its consultants, and staff. Persons desiring to make oral statements should notify Richard K. Major, ACNW, as far in advance as practicable so that appropriate arrangements can be made to schedule the necessary time during the meeting for such statements. Use of still, motion picture, and television cameras during this meeting will be limited to selected portions of the meeting as determined by the ACNW Chairman. Information regarding the time to be set aside for taking pictures may be obtained by contacting the ACNW office, prior to the meeting. In view of the possibility that the schedule for ACNW meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should notify Mr. Major as to their particular needs.

Further information regarding topics to be discussed, whether the meeting has been canceled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefore can be obtained by contacting Mr. Richard K. Major, ACNW (Telephone 301/415–7366), between 8:00 A.M. and 5:00 P.M. EST. ACNW meeting notices, meeting transcripts, and letter reports are now available for downloading or reviewing on the internet at http://www.nrc.gov/ACRSACNW.

Dated: January 28, 2000.

Annette Vietti-Cook,

Acting Advisory Committee Management Officer.

[FR Doc. 00–2386 Filed 2–2–00; 8:45 am]

BILLING CODE 7590–01–P

NUCLEAR REGULATORY COMMISSION

Working Group Meeting on Control of Solid Materials

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of meeting.

SUMMARY: The Nuclear Regulatory Commission (NRC) staff Working Group on control of solid materials will hold regular meetings to develop the Commission paper to be prepared for submittal to the Commission in March 2000. The meetings will be open for the public to observe the processes used for the development of the paper.

DATES: Wednesday, February 9, 2000, from 1 p.m. to 3 p.m., and alternate Wednesdays after that date.

ADDRESSES: Nuclear Regulatory Commission, Room T7–A1, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland.

FOR FURTHER INFORMATION CONTACT: Frank Cardile; e-mail: *fpc@nrc.gov*, telephone: (301) 415–6185; or Anthony Huffert; e-mail: *amh1@nrc.gov*, Office of Nuclear Material Safety and Safeguards, USNRC, Washington DC 20555–0001.

SUPPLEMENTARY INFORMATION: The NRC previously published an Issues Paper in a **Federal Register** notice (FRN) on June 30, 1999 (64 FR 35090), indicating that it is examining its current approach for