

## Appendix F

# Other Board Communications

- Letter from B. John Garrick to Robert R. Loux, Executive Director, Agency for Nuclear Projects, State of Nevada; February 18, 2005.  
Subject: Response to November 25, 2003, letter on potential criticality for waste packages.
- Statement of Chairman B. John Garrick before the Subcommittee on the Federal Workforce and Agency Organization, Committee on Government Reform, U.S. House of Representatives; April 5, 2005.
- Letter from Congressman Jon Porter, Chairman, Subcommittee on the Federal Workforce and Agency Organization, Committee on Government Reform, U.S. House of Representatives to B. John Garrick; April 14, 2005.  
Subject: Questions from the Subcommittee.
- Letter from B. John Garrick to Congressman Jon Porter, Chairman, Subcommittee on the Federal Workforce and Agency Organization, Committee on Government Reform, U.S. House of Representatives; April 29, 2005.  
Subject: Responses to questions posed in letter of April 14, 2005





UNITED STATES  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
2300 Clarendon Boulevard, Suite 1300  
Arlington, VA 22201

February 18, 2005

Mr. Robert R. Loux  
Executive Director  
Agency for Nuclear Projects  
State of Nevada  
1761 E. College Parkway, Suite 118  
Carson City, NV 89706

Dear Mr. Loux:

This letter is in response to your November 25, 2003, letter to Dr. Michael L. Corradini on criticality. That letter was based primarily on an analysis by Dr. Michael C. Thorne, a consultant to the State of Nevada, of studies and documents produced in 1998 by U. S. Department of Energy (DOE) consultants and contractors. Those studies and documents were about the probability of the occurrence of internal criticalities in surface storage casks for a nominal case assuming the permanent loss of institutional control, and about the consequences of such criticalities.<sup>1</sup>

The likelihood and consequences of criticality, if it occurs, are recognized universally as important issues. The DOE has been studying such issues with respect to the disposal of spent nuclear fuel and high-level radioactive waste in a mined geologic repository, and the Board has been monitoring those DOE activities for well over a decade.

Analyses of potential criticality for waste packages emplaced in a repository should be based on representative assumptions about the packages and the conditions to which they would be exposed in a repository. There are significant differences between storage casks and emplaced waste packages that should be taken into account. The differences include the more corrosion-resistant material proposed for waste packages in the current design, the use of neutron-absorber plates or control rods in waste packages containing higher-reactivity spent fuel, and the use of drip shields over the emplaced waste packages. Such differences were not taken into account in the analysis underlying your November 25 letter.

In a recent report, the DOE concludes that the probability of internal criticality in a mined geologic repository for the nominal case during a 10,000-year regulatory compliance period is well below the threshold of regulatory significance.<sup>2</sup> We have reviewed this report and find that the conclusion drawn in the report is credible, given the credit for the integrity of the packages and the presence of the drip shields, which would prevent water from entering the packages, even with the assumption that 10 percent of the packages would fail over 10,000 years.

<sup>1</sup> An internal criticality is a self-sustaining nuclear reaction *inside* a storage cask (or waste package). A nominal case is a case that is not disrupted by seismic or igneous events.

<sup>2</sup> *Screening Analysis of Criticality Features, Events, and Processes for License Application*, ANL-EBS-NU-000008 REV 01, October 2004


The DOE's conclusion and our finding, however, generally are based on analysis that covers the first 10,000 years after repository closure.

Last year, the United States Court of Appeals for the District of Columbia Circuit rendered a decision vacating the Environmental Protection Agency standard and the corresponding Nuclear Regulatory Commission (NRC) rule to the extent that the standard and the rule incorporated a 10,000-year compliance period. Presumably, a revised standard and a corresponding rule will be promulgated to reflect the court's decision. Any significant change in the standard and its corresponding rule regarding the regulatory compliance period or the definition of the threshold of regulatory significance will necessitate reexamining repository criticality issues.

The Board's mission is to evaluate the technical and scientific validity of DOE activities related to the Nuclear Waste Policy Act, including the packaging, transportation, and disposal of high-level radioactive waste and spent nuclear fuel. Criticality clearly is an important issue related to those activities. The Board has reported on criticality issues in the past and will continue to monitor ongoing developments and activities of the DOE's Office of Civilian Radioactive Waste Management related to criticality. Thus, we appreciate your letter of November 25 and the material that was enclosed with it.

Thank you for your interest in the Board.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. John Garrick', with a horizontal line extending to the right.

B. John Garrick  
Chairman

cc:

Dr. Margaret S. Y. Chu, DOE  
Dr. C. William Reamer, NRC

bjg019vf

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**Statement of  
Dr. B. John Garrick, Chairman  
U.S. Nuclear Waste Technical Review Board  
Before the  
Subcommittee on the Federal Workforce and Agency Organization  
Committee on Government Reform  
U.S. House of Representatives  
April 5, 2005**

Good morning, Mr. Chairman and members of the subcommittee. I am John Garrick, Chairman of the U.S. Nuclear Waste Technical Review Board. All eleven members of the Board are appointed by the President and serve on a part-time basis. In my case, I am a private consultant specializing in the application of the risk sciences to complex technological systems in the space, defense, chemical, marine, and nuclear fields.

As you know, Mr. Chairman, the Board was created by Congress in the Nuclear Waste Policy Amendments Act of 1987 to perform an ongoing independent evaluation of the technical and scientific validity of the Department of Energy's (DOE) efforts in implementing the Nuclear Waste Policy Act. The Board began its work in 1989 and has continuously reviewed the technical and scientific validity of DOE activities since that time. I am pleased to represent the Board at this hearing.

According to the letter inviting the Board to participate, today's hearing has two purposes. The first purpose is to question whether federal employees falsified documents related to work at the Yucca Mountain site. The second purpose identified in the letter is to examine whether sound science exists for the proposed project, in light of the allegations.

Mr. Chairman, it would be inappropriate for the Board to draw any conclusions at this time about the significance for the technical work at Yucca Mountain of the group of redacted e-mails that were posted on the subcommittee's web site on Friday afternoon. Answers to questions that might be raised by or about the e-mails should await the completion of comprehensive investigations already underway at the Departments of Energy and Interior. The Board will follow the progress of those investigations, and when they are concluded, the Board will evaluate the significance of the results for the DOE's technical and scientific work. We will then report our findings to Congress and the Secretary of Energy. In the meantime, the Board will continue its ongoing technical and scientific peer review of DOE activities. The Nuclear Regulatory Commission (NRC) is the appropriate agency to address questions about the effects on the regulatory process of possible infractions of quality assurance procedures.

As you know, Mr. Chairman, reporting to Congress and the Secretary at least twice a year is an important part of the Board's mandate. In accordance with that mandate, in late 2004, the Board sent to Congress and the Secretary a report summarizing areas of progress in the Yucca Mountain program; issues that, in the Board's view, require additional attention; and the Board's priorities for 2005. Since the second purpose of this hearing touches on technical and scientific validity, I will now summarize some of the Board's findings from that letter report.

The Board believes that over the last year or so, the DOE has made progress in several areas. For

example, a key corrosion issue raised by the Board was addressed by DOE data and analyses, indicating that tunnel conditions during the thermal pulse will likely not lead to the initiation of localized corrosion of the waste packages due to deliquescence of calcium chloride. The Board also is encouraged by DOE efforts related to making earthquake ground-motion estimates more realistic and in completing an aeromagnetic survey that could shed light on igneous activity in the Yucca Mountain area. In addition, the DOE has made headway in developing a systematic approach to planning for the transportation of spent nuclear fuel and high-level radioactive waste.

Other issues require continued or additional attention, including an improved understanding and a clear explanation of the likely conditions inside repository tunnels during the thermal pulse; other corrosion issues related to the postclosure environment of the repository; the resolution of discrepancies among chlorine-36 studies; and improvements in the modeling of volcanic consequences. The Board also will follow with interest the work undertaken by the science and technology program established by Dr. Margaret Chu.

In addition to reviewing these important issues, the Board is establishing priorities for its technical and scientific review as the DOE prepares the information necessary to submit a license application to the NRC. In identifying its priorities, the Board considers (1) if the issue is important to the safe performance of the repository, (2) if the issue is important to public confidence, and (3) if the Board has special expertise and experience, which provide new and relevant perspectives on technical issues. In particular, the Board intends to review the DOE's technical and scientific work and analysis supporting total system performance assessment (TSPA). The Board will evaluate the extent to which the DOE has used TSPA as an integrative tool and how well the assumptions underlying TSPA results are supported by technical analysis and available evidence. Other Board priorities include an improved understanding of the performance of the hydrogeologic barriers, particularly regarding the magnitude and timing of the peak dose; how the DOE's thermal-loading strategy might affect trade-offs between preclosure and postclosure risk; issues affecting the waste-package lifetime; and the DOE's continued efforts to develop an integrated waste management system, including the handling, transportation, packaging, and disposal of spent nuclear fuel and high-level radioactive waste. The Board is especially interested in scientific work and analyses that may be undertaken by the DOE in response to likely changes in the regulatory compliance period for a Yucca Mountain repository.

Mr. Chairman, let me close by saying that the Board looks forward to continuing its congressionally established role of performing an independent evaluation of the DOE's technical and scientific activities related to the disposal, packaging, and transportation of the country's spent nuclear fuel and high-level radioactive waste and reporting to Congress and the Secretary. We will be in a much better position to comment on the topics of this hearing once we have reviewed the findings of the comprehensive investigations that are currently underway.

Thank you for the opportunity to present the Board's views. I will be happy to respond to questions from the subcommittee.

TOM DAVIS, VIRGINIA,  
CHAIRMAN

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## Congress of the United States House of Representatives

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April 14, 2005

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Honorable B. John Garrick  
Chairman  
Nuclear Waste Technical Review Board  
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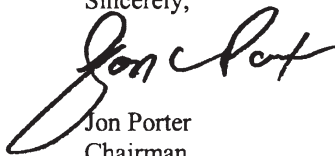
Dear Mr. Garrick:

Attached are the follow up questions to the hearing titled, "Yucca Mountain Project: Have Federal Employees Falsified Documents?" on Tuesday April 5, 2005. Please answer the attached questions, furnish any information that was requested during the hearing and return this **no later than Friday, April 29, 2005**. Please be certain to attach a cover sheet to your answers and include your name on each page of your responses.

Please return your responses no later than **Friday, April 29, 2005**, to Reid Voss, Subcommittee on Civil Service and Agency Organization, B-373A Rayburn House Office Building, Washington, D.C. 20515. Because of mail delays, we ask that you email responses to the questions for the record to [reid.voss@mail.house.gov](mailto:reid.voss@mail.house.gov) before the deadline above. Please mail all original documents as well. If you have any questions please call Reid Voss at 202-225-5147.

Thank you for your participation and cooperation.

Sincerely,



Jon Porter  
Chairman  
Subcommittee on the Federal Workforce  
and Agency Organization



**“Yucca Mountain Project: Have Federal Employees Falsified Documents?”  
Subcommittee on the Federal Workforce and Agency Organization  
Chairman Jon C. Porter  
Questions Submitted For The Record**

Submitted April 8, 2005

**John Garrick, U.S. Nuclear Waste Technical Review Board**

- If the allegations are proven true, what is the impact the “sound science” of the project?
- We know for certain that the e-mails in question were written during the time that DOE was rushing to prepare and submit a license application to the NRC. How many times has DOE asked for an extension in filing the license application and what reasons were given in support of an extension of time?
- Based upon DOE’s persistent quality assurance failures and in light of the recent controversy documenting employee falsification of scientific studies, what is the Board’s position regarding the current state of the scientific credibility of the project?
- Should the allegations be proven true, what is the board’s recommendation regarding the continuation of the project?
- It is my understanding that this past February (February 8, 2005) the Board called for hearings in March to review concerns over the corrosion of the titanium drip shields that are intended to keep water from leaking into casks inside Yucca Mountain. Have you held those hearings and, if so, what were your findings?
- Given the fact that DOE is self-regulated and can chose not to implement the recommendations of the Board, has there ever been a feeling among the Board that DOE uses its privilege to hide information?
- Based upon your review, has DOE come up with a plan for safely transporting nuclear waste to the proposed repository?
- To your knowledge, what has DOE done to study the transportation issues?
- If scientific studies concerning the hydrology and geology of Yucca Mountain were falsified, and if falsified reports were used as the basis for other work, how would that affect the overall reliability of the scientific studies at Yucca Mountain?



- Based on the quality of the science seen in the e-mails we have released, can we be certain that the waste stored at the site can be safely contained for even several hundred years?
- Does the NWTRB plan any particular action in response to these charges? (Such as revisit previous conclusions or more aggressive review of DOE)





UNITED STATES  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
2300 Clarendon Boulevard, Suite 1300  
Arlington, VA 22201

April 29, 2005

The Honorable Jon Porter  
Chairman  
Subcommittee on the Federal Workforce  
and Agency Organization  
Committee on Government Reform  
U.S. House of Representatives  
B-373A Rayburn House Office Building  
Washington, DC 20515

Dear Chairman Porter:

Thank you very much for the opportunity to present the views of the Nuclear Waste Technical Review Board at a hearing before the Subcommittee on the Federal Workforce and Agency Organization on April 5, 2005. Enclosed are responses to follow-up questions from that hearing that were transmitted in your letter of April 14, 2005.

As you know, the Board is charged by Congress with conducting an ongoing and independent review of the technical and scientific validity of activities undertaken by the Secretary of Energy associated with implementing the Nuclear Waste Policy Act. The Board provides its technical views to help inform the consideration of issues related to the management and disposal of spent nuclear fuel and high-level radioactive waste.

Please do not hesitate to contact me or have your staff contact Bill Barnard, Board Executive Director, if you have questions related to the Board's responses or any other issue related to the Board's technical and scientific review.

Sincerely,

{Signed by}

B. John Garrick  
Chairman

Enclosure

**“Yucca Mountain Project: Have Federal Employees Falsified Documents?”**

**Subcommittee on the Federal Workforce and Agency Organization**

**Chairman Jon C. Porter**

**Questions Submitted For the Record**

**Submitted April 8, 2005**

*Answers Submitted April 29, 2005*

**John Garrick, U.S. Nuclear Waste Technical Review Board**

- **If the allegations are proven true, what is the impact the “sound science” of the project?**

Answer: It is not possible to reach conclusions about what effect, if any, there may be on the scientific program until investigations currently under way at the Department of Energy (DOE) and the Department of the Interior (DOI) are concluded. At that point, the Board will evaluate the results of the investigations to determine if they have implications for the validity of the DOE’s technical and scientific work. In the meantime, the Board will continue reviewing the technical and scientific validity of ongoing DOE activities. In accordance with its mandate established in the Nuclear Waste Policy Amendments Act, the Board will report its findings and recommendations from those evaluations to Congress and the Secretary of Energy.

- **We know for certain that the e-mails in question were written during the time that DOE was rushing to prepare and submit a license application to the NRC. How many times has DOE asked for an extension in filing the license application and what reasons were given in support of an extension of time?**

Answer: The Board’s understanding is that the DOE decides when to submit a license application (LA). Consequently, any deadline that the DOE might have had for submitting an LA would have been self-imposed.

- **Based upon DOE’s persistent quality assurance failures and in light of the recent controversy documenting employee falsification of scientific studies, what is the Board’s position regarding the current state of the scientific credibility of the project?**

Answer: The Board believes that a rigorous quality assurance program is important for this scientific program. However, deficiencies in complying with quality assurance requirements, which are monitored by the Nuclear Regulatory Commission (NRC), may or may not significantly affect the DOE’s technical and scientific findings. The Board will review this matter when investigations currently under way at the DOE and the DOI are concluded. In the meantime, the Board will continue evaluating the technical and scientific validity of the DOE’s ongoing activities and providing its straightforward assessment to Congress and the Secretary.

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- **Should the allegations be proven true, what is the board's recommendation regarding the continuation of the project?**

Answer: At this time, the Board does not know how the allegations, if proven true, would affect the DOE's technical and scientific program. In any case, a decision related to continuing the Yucca Mountain program is a matter of policy that is well beyond the Board's technical and scientific purview. Through its regular and special reports, the Board provides technical and scientific information to policy-makers, who can then use the Board's assessment when making policy decisions. As has always been the case, if at some point the Board were to determine that a condition or conditions existed that clearly made the site unsuitable, the Board would make its opinion known to Congress and the Secretary immediately.

- **It is my understanding that this past February (February 8, 2005) the Board called for hearings in March to review concerns over the corrosion of the titanium drip shields that are intended to keep water from leaking into casks inside Yucca Mountain. Have you held those hearings and, if so, what were your findings?**

Answer: No "hearings" were requested, but the Board did ask the DOE to discuss the drip shields at our next meeting. That meeting is currently planned for November 8, 2005, in Las Vegas, Nevada.

- **Given the fact that DOE is self-regulated and can choose not to implement the recommendations of the Board, has there ever been a feeling among the Board that DOE uses its privilege to hide information?**

Answer: Congress clearly intended that the Board function as a peer reviewer – not as a regulator or a program manager. While it is true that the Board was not granted authority to implement its recommendations, Congress provided the Board access to all information necessary for conducting its ongoing review, including draft documents produced by the DOE. Over the years, all the documents that have been requested from the DOE, including drafts, have been provided within a reasonable time frame. However, the Board can only request and evaluate information that it knows about.

- **Based upon your review, has DOE come up with a plan for safely transporting nuclear waste to the proposed repository?**

Answer: The DOE is developing a plan and is working on the integration of waste management activities. Although at this point the Board has no reason to believe that a safe transportation system cannot be developed, the DOE has a great deal of work to do before it can claim credibly that it has a workable plan in place for safely transporting spent nuclear fuel or high-level radioactive waste.

- **To your knowledge, what has DOE done to study the transportation issues?**

Answer: The DOE reported on its efforts to develop a transportation system at four Board meetings held in the last year and a half. Examples of DOE activities that were discussed at those meetings include developing a systematic approach to transportation planning; identifying critical transportation planning components and their interdependencies; developing tools and analyzing issues associated with ensuring safe, secure, and efficient transportation; and working on the integration of transportation activities with activities related to the transfer of spent nuclear fuel and high-level radioactive waste at generation sites and with the receipt and handling of the wastes at the proposed repository site. For much more detailed information on the DOE presentations, transcripts of Board meetings and Board letters to and from the DOE are available on the Board's Web site at, [www.nwtrb.gov](http://www.nwtrb.gov).

- **If scientific studies concerning the hydrology and geology of Yucca Mountain were falsified, and if falsified reports were used as the basis for other work, how would that affect the overall reliability of the scientific studies at Yucca Mountain?**

Answer: If data or analyses were falsified and if those data or analyses significantly affected repository performance estimates, the consequences could be serious. However, the Board has no evidence at this point to indicate that that is the case. It is not clear how a change in a single parameter would affect the DOE's estimates of repository performance, which are based on a range of values. The Board will look very carefully at this issue.

- **Based on the quality of the science seen in the e-mails we have released, can we be certain that the waste stored at the site can be safely contained for even several hundred years?**

Answer: Drawing conclusions about the quality of the science is not possible until the results of investigations currently under way at the DOE and the DOI are known. To date, the Board has seen no evidence suggesting that the containment capability of the repository would be limited to a few hundred years.

- **Does the NWTRB plan any particular action in response to these charges? (Such as revisit previous conclusions or more aggressive review of DOE)**

Answer: The Board's technical and scientific evaluation of the DOE's work is ongoing and vigorous. Consequently, the Board reviews its findings and analyses whenever necessary or appropriate. As stated previously, the Board will evaluate the results of the DOE and DOI investigations when they are available and will determine their implications for the validity of the DOE's technical and scientific work. In the meantime, the Board will continue reviewing the DOE's ongoing activities. In accordance with its congressional mandate, the Board will regularly and candidly report its findings and recommendations to Congress and the Secretary of Energy.