

UNITED STATES OF AMERICA  
U.S. NUCLEAR REGULATORY COMMISSION

WORK ORDER 76

FORTHCOMING MEETING BETWEEN  
U.S. NUCLEAR REGULATORY COMMISSION AND THE  
PETITIONER, BEYOND NUCLEAR REGARDING  
10 CFR 2.206 PETITION REQUEST TO SUSPEND  
GENERAL ELECTRIC MARK I BOILING WATER  
REACTORS OPERATING LICENSES DUE TO FLAWED  
PRIMARY CONTAINMENT AND UNRELIABLE BACK-UP  
ELECTRIC POWER SYSTEMS FOR COOLING SPENT  
FUEL POOLS

OCTOBER 7, 2011

10:00 A.M. - 12:00 P.M.

TRANSCRIPT OF PROCEEDINGS

Public Meeting

## APPEARANCES

## Participants:

Siva Lingam  
Petition Manager  
Division of Operating Reactor Licensing (DORL)

Robert Nelson  
Deputy Director,  
Division of Policy and Rulemaking,  
Office of Nuclear Reactor Regulation,  
Chairman,  
Petition Review Board

Lee Banic  
2.206 Petition Coordinator,  
Division of Policy and Rulemaking, NRC

Sam Miranda  
Technical Reviewer,  
Office of Nuclear Reactor Regulation,  
Reactor Systems Branch.

Vijay Goel  
Electrical Engineer  
Office on Nuclear Reactor Regulation

Mike Clark  
NRC's Office of the General Counsel.

Ed Smith  
NRR Balance of Plant Division, Technical Reviewer

Alexa Simon  
Office of the General Counsel.

Mel Gray  
Branch Chief, Region 1  
Division of Reactor Projects.

Dave Hills, Engineering Branch Chief,  
Region 3.

Tom Farnholtz  
Engineering Branch Chief, Region 4.

## APPEARANCES

## Participants:

Paul Gunter  
Director of Reactor Oversight at Beyond Nuclear.

Kevin Kamps  
Radioactive Waste Specialist  
Beyond Nuclear.

Dale Bridenbaugh  
Retired Nuclear Engineer

Arnie Gundersen  
Chief Engineer  
Fairewinds Associates

Deborah Katz  
Executive Director  
Citizens Awareness Network.

Louis A. Zeller  
Science Director  
Blue Ridge Environmental Defense League.

Randy Kehler  
Coordinator  
Safe & Green Energy Campaign.

Michael Mariotte  
Executive Director  
Nuclear Information and Resource Services.

Bobbie Paul  
Executive Director  
Georgia Women's Action for New Direction (WAND)

## 1 PROCEEDINGS

2 ROBERT NELSON: Before we get started I'd like to check for the  
3 co-petitioners on the phone line, please. Is Mr. Bridenbaugh on the line?

4 DALE BRIDENBAUGH: Yes I am.

5 ROBERT NELSON: Thank you. Mr. Gundersen, are you on the  
6 line?

7 ARNIE GUNDERSEN: Yes I am.

8 ROBERT NELSON: Thank you very much. Ms. Katz, are you on  
9 the line?

10 DEBORAH KATZ: Yes I am.

11 ROBERT NELSON: Thank you. Excuse me, Louis Zeller, are you  
12 on the line?

13 LOUIS ZELLER: Yes I'm here.

14 ROBERT NELSON: Thank you. Mr. Kehler, are you on the line?

15 RANDY KEHLER: Yes I am.

16 ROBERT NELSON: Thank you. Mr. Mariotte is here. Ms. Paul,  
17 are you on the line?

18 DEB PAUL: Yes I am.

19 ROBERT NELSON: Thank you very much. I think we have  
20 everyone on the line.

21 SIVA LINGAM: Good morning, everybody. I am Siva Lingam. I  
22 am the petition manager for this. I would like to thank everyone for attending this  
23 meeting. We are here today to allow the petitioners from Beyond Nuclear,  
24 represented by Mr. Paul Gunter and Mr. Kevin Kamps and co-petitioners from  
25 Habitat for Humanity Volunteer and ex-General Electric manager Mr. Dale

1 Bridenbaugh, Fairewinds Associates represented by Mr. Arnie Gundersen,  
2 Citizens Awareness Network represented by Ms. Deb Katz, Blue Ridge  
3 Environmental Defense League represented by Mr. Louis Zeller, Safe and Green  
4 Campaign represented by Mr. Randy Kehler, Nuclear Information and Resource  
5 Service represented by Mr. Michael Mariotte, and Georgia WAND represented by  
6 Ms. Bobbie Paul to address the NRC Petition Review Board and also referred to  
7 as the PRB, regarding the 2.206 petition dated April 13, 2011.

8 I am the petition manager for the petition and Mr. Robert Nelson is  
9 the Petition Review Board Chairman. As part of the PRB's review of the petition,  
10 the petitioners were offered an initial opportunity to address the PRB, to provide  
11 any relevant additional explanation and support for the petition.

12 At the request of Mr. Paul Gunter of Beyond Nuclear, the PRB  
13 conducted a public meeting on June 8, 2011. The PRB reviewed all the  
14 presentation material at this meeting and the PRB recommendations were  
15 provided to Mr. Paul Gunter by email on August 16, 2011.

16 In summary, the PRB's initial recommendation is to accept some of  
17 the petitioners' concerns for NRC's further review and reject some of the  
18 petitioners' concerns. The details can be found on NRC's Agencywide  
19 Document Access and Management System known as ADAMS, with Accession  
20 Number ML112340018.

21 As part of the PRB's review of the petition, the petitioners were  
22 offered a second opportunity to address the PRB, to provide any relevant  
23 supplemental information and support for the petition that can affect the PRB  
24 recommendations. Mr. Paul Gunter requested this second meeting to address  
25 the PRB. Mr. Paul Gunter requested that co-petitioners Mr. Dale Bridenbaugh,

1 Habitat for Humanity volunteer and ex-GE manager, Mr. Arnie Gundersen of  
2 Fairewinds Associates, Ms. Deb Katz of Citizens Awareness Network, Mr. Lou  
3 Zeller of Blue Ridge Environmental Defense League, Mr. Randy Kehler of Safe &  
4 Green Campaign, Mr. Michael Mariotte of Nuclear Information and Resource  
5 Service, and Ms. Bobbie Paul of Georgia WAND be given an opportunity to  
6 address the PRB during this meeting.

7 For the rest of the co-petitioners, there will be no opportunity to  
8 speak due to time constraints, however, we will consider written comments  
9 e-mailed to me at [siva.lingam@nrc.gov](mailto:siva.lingam@nrc.gov) by October 14, 2011.

10 This meeting is scheduled for two hours, from 10 a.m. to 12 noon.  
11 The meeting can be viewed on the webcast, with a delay of thirty seconds. The  
12 meeting is being recorded by the NRC Operations Center and will be transcribed  
13 by a court reporter. The transcript will become a supplement to the petition. The  
14 transcript will also be made publicly available through the NRC ADAMS.

15 For those at the NRC headquarters, we have public meeting  
16 feedback forms that you are welcome to fill out. These forms are forwarded to  
17 our internal communications specialists. You may either leave them here  
18 following the meeting or mail them back. They are already post-paid. If you are  
19 participating by phone or viewing this meeting on the webcast and would like to  
20 leave email feedback on this public meeting, please forward your comments to  
21 me by e-mail: [siva.lingam@nrc.gov](mailto:siva.lingam@nrc.gov).

22 I'd like to open this meeting with introductions of the meeting  
23 participants. I ask that all of the participants clearly state for the record your  
24 name, your position or occupation, and your organization. For those here in the  
25 room, please speak up or approach the microphone so the persons on the phone

1 and the webcast can hear clearly and so that the court reporter can accurately  
2 record your name.

3 I will start with myself and the other NRC participants here in the  
4 room. I am Siva Lingam. I am the petition manager and I work for NRR, DORL.

5 ROBERT NELSON: Good morning and welcome. My name is  
6 Robert Nelson. I'm Deputy Director, Division of Policy and Rulemaking in the  
7 Office of Nuclear Reactor Regulation and I am the chairman for this Petition  
8 Review Board.

9 LEE BANIC: Lee Banic, 2.206 petition coordinator for Division of  
10 Policy and Rulemaking, NRC.

11 SAM MIRANDA: My name is Sam Miranda. I'm a technical  
12 reviewer in the Office of Nuclear Reactor Regulation, Reactor Systems branch.

13 VIJAY GOEL: Vijay Goel, Electrical Engineer from the Office on  
14 Nuclear Reactor Regulation, Division of [unintelligible].

15 MIKE CLARK: I'm Mike Clark. I'm an attorney with NRC's Office of  
16 the General Counsel.

17 ED SMITH: I'm Ed Smith with NRR Balance of Plant Division,  
18 Technical Reviewer.

19 MALE SPEAKER: (Inaudible) NRC Partners (inaudible) from  
20 headquarters, on the phone.

21 ALEXA SIMON: Alexa Simon from the Office of the General  
22 Counsel.

23 SIVA LINGAM: Anybody else? Are there any NRC participants  
24 from the regional offices on the phone? Region 1, please?

25 MEL GRAY: This is Mel Gray branch chief out of Region 1 in the

1 Division of Reactor Projects.

2 SIVA LINGAM: Region 2, please. Region 3.

3 DAVE HILLS: This is Dave Hills, Engineering Branch Chief, Region

4 3.

5 SIVA LINGAM: Region 4, please.

6 TOM FARNHOLTZ: This is Tom Farnholtz, Engineering Branch

7 Chief, Region 4.

8 SIVA LINGAM: Are there any other presenters from the licensee in

9 this room? Any representatives for the licensee in this room? Mr. Gunter, Mr.

10 Kamps, would you please introduce yourselves for the record?

11 PAUL GUNTER: Thank you. My name is Paul Gunter. I'm

12 Director of Reactor Oversight at Beyond Nuclear. We're in Tacoma Park,

13 Maryland.

14 KEVIN KAMPS: My name is Kevin Kamps, Radioactive Waste

15 Specialist at Beyond Nuclear.

16 SIVA LINGAM: Mr. Bridenbaugh, would you please introduce

17 yourself for the record? Mr. Bridenbaugh?

18 DALE BRIDENBAUGH: I'm a retired nuclear engineer and I'm

19 speaking as an individual. I have no connection with Habitat for Humanity other

20 than as a volunteer.

21 SIVA LINGAM: Mr. Gundersen, would you please introduce

22 yourself for the record?

23 ARNIE GUNDERSEN: Yes. This is Arnie Gundersen. I'm the

24 chief engineer of Fairewinds Associates in Burlington, Vermont. I speak today as

25 a private citizen, not a nuclear engineer with 40 years' experience. I am not

1 retained by any of the groups on your agenda.

2 SIVA LINGAM: Ms. Katz, would you please introduce yourself for  
3 the record?

4 DEBORAH KATZ: Deborah Katz. I'm the executive director of the  
5 Citizens Awareness Network.

6 SIVA LINGAM: Mr. Zeller, would you please introduce yourself for  
7 the record?

8 LOUIS ZELLER: Yes. My name is Louis A. Zeller. I'm the science  
9 director for the Blue Ridge Environmental Defense League.

10 SIVA LINGAM: Mr. Kehler, would you please introduce yourself for  
11 the record?

12 RANDY KEHLER: My name is Randy Kehler and I'm a coordinator  
13 for the Safe & Green Energy Campaign.

14 SIVA LINGAM: Mr. Mariotte would you please introduce yourself  
15 for the record?

16 MICHAEL MARIOTTE: I am Michael Mariotte. I am Executive  
17 Director of Nuclear Information and Resource Services.

18 SIVA LINGAM: Ms. Paul, would you please introduce yourself for  
19 the record?

20 BOBBIE PAUL: Good morning. My name is Bobbie Paul. And I  
21 serve as executive director of Georgia Women's Action for New Direction,  
22 sometimes referred to as WAND here in the state of Georgia.

23 SIVA LINGAM: Thank you. I would like to emphasize that NRC  
24 staff and all presenters each need to speak clearly and loudly to make sure that  
25 the court reporter can accurately transcribe this meeting. If you do have

1 something that you would like to say, please first state your name for the record.

2 For those dialing into the meeting, please remember to mute your  
3 phones to minimize any background noise or distractions if you are not speaking.  
4 If you do not have a mute button, this can be done by pressing the keys \*6. To  
5 unmute, press the \*6 keys again. Please note that the NRC operations center  
6 has already muted the phones of people who are not addressing the PRB.

7 Thank you.

8 And at this time I will turn it over to the PRB Chairman, Mr. Robert  
9 Nelson.

10 ROBERT NELSON: Good morning and welcome. Excuse me.

11 This meeting is regarding the 2.206 petitions submitted by Mr. Gunter and  
12 Mr. Kamps of Beyond Nuclear and the rest of the co-petitioners.

13 I'd like to first share some background in our process. Section  
14 2.206 of Title 10 of the Code of Federal Regulations describes the petition  
15 process – the primary mechanism for the public to request enforcement action by  
16 the NRC in a public process. This process permits anyone to petition NRC to  
17 take enforcement-type action related to NRC licensees or licensed activities.  
18 Depending on the results of its evaluation, NRC could modify, suspend, or  
19 revoke an NRC license -- excuse me -- any NRC-issued license or take any other  
20 appropriate enforcement action to resolve the problem. The NRC staff's  
21 guidance for the disposition of 2.206 petition requests is in Management  
22 Directive 8.11 which is publicly available.

23 The purpose of today's meeting is to give the petitioners an  
24 opportunity to provide any additional explanation or support for the petition before  
25 the Petition Review Board's final consideration and recommendation. This

1 meeting is not a hearing nor is it an opportunity for the petitioner to question or  
2 examine the Petition Review Board on the merits or issues presented in the  
3 petition request.

4           The Petition Review Board typically consists of a Chairman, usually  
5 a manager at the senior executive service level at the NRC. That would be me,  
6 Robert Nelson. It has a petition manager, that's Siva Lingam, and a PRB  
7 coordinator, that's Lee Bannic. Other members of the board determined by the  
8 NRC staff based on the content of the information in the petition request.

9           At this time I would like to introduce the Board.

10 I am Robert Nelson, the Petition Review Board Chairman. Siva Lingam is the  
11 Petition Manager for the petition under discussion today. Merrilee Banic is the  
12 office's PRB Coordinator. Our technical staff includes: Mr. Samuel Miranda from  
13 the Office of Nuclear Reactor Regulation's Reactor Systems Branch, Mr. Edward  
14 Smith from the Office of Nuclear Reactor Regulation's Balance-of-Plant Branch,  
15 Mr. Kamal Manoly, Senior Technical adviser, from the Office of Nuclear Reactor  
16 Regulation's Division of Engineering, Vijay Goel from the Office of Nuclear  
17 Reactor Regulation's Electrical Engineering Branch, Gerry Gulla from the Office  
18 of Enforcement, Lauren Gibson, Division of Operating Reactor Licensing,  
19 Communications Team, Mel Gray from the NRC Region 1 Office located in King  
20 of Prussia, Pennsylvania, Harold Christensen from the NRC Region 2 Office  
21 located in Atlanta, Georgia, David Hills from the NRC Region 3 Office located in  
22 Lisle, Illinois and Tom Farnholtz from the NRC Region 4 Office located in  
23 Arlington, Texas. We obtain advice from our Office of General Counsel,  
24 represented by Michael Clark.

25           As described in our process, the NRC staff may ask clarifying

1 questions in order to better understand the petitioner's presentation and to reach  
2 a reasoned decision whether to accept or reject the petitioner's requests for  
3 review under the 2.206 process. Also, as described in our process, the licensees  
4 have been invited to participate in today's meeting to ensure that they  
5 understand the concerns about their facilities or activities. While the licensees  
6 may also ask questions to clarify the issues raised by the petitioner, I want to  
7 stress that the licensees are not a part of the Petition Review Board's decision-  
8 making process.

9 I'd now like to summarize the PRB's understanding of the scope of  
10 the petition under consideration and NRC's activities to date.

11 On April 13, 2011, Mr. Paul Gunter and Mr. Kevin Kamps of  
12 Beyond Nuclear, who will be referred to as the petitioners, submitted a petition  
13 under Title 10 of the Code of Federal Regulations Part 2.206, regarding  
14 immediate shutdown of all GE reactors with Mark I containments, which I will  
15 refer to as Mark I reactors. More than 8,000 people requested to be added as  
16 co-petitioners to the above mentioned Beyond Nuclear petition, and will  
17 collectively -- excuse me --and will be collectively referred to as co-petitioners.

18 The petitioners seek the enforcement action to immediately  
19 shutdown all Mark I reactors for the following reasons that are followed by the  
20 PRB's initial recommendation for each reason. One: Fundamentally flawed  
21 combination of free standing steel primary containments for the pressure  
22 suppression containment systems. The PRB rejected this for further review.  
23 NRC redressed and resolved Mark I containment structural integrity concerns  
24 through NUREGs 0474 and 0661.

25 Two: Spent fuel pools elevated to the top of the reactor building

1 outside and above the rated containment structure without safety related backup  
2 electrical power Class 1E systems to cool high-density storage of thermally hot  
3 and highly radioactive waste in the event of loss of grid power. The Fukushima  
4 Dai-Ichi nuclear catastrophe demonstrates the vulnerability of this large volume  
5 of nuclear materials outside of any rated containment in the event of a prolonged  
6 electrical grid power failure without backup emergency AC electrical generators  
7 and without the additional of reliable emergency backup of the DC battery  
8 systems. PRB has accepted this for further review. This pertains to the events  
9 in Japan and recent Browns Ferry partial loss of offsite power due to a tornado.

10 Three: The subject Mark I units were identified as early as  
11 September 22, 1972 by a memo from Dr Stephen Hanauer of the U.S. Atomic  
12 Energy Commission to be vulnerable to early failure under severe accident  
13 conditions including over-pressurization. Moreover, safety concerns over the  
14 substandard Mark I pressure suppression contain system were again affirmed in  
15 1986 by Dr. Harold Denton, Director of the Office of Nuclear Reactor Regulation,  
16 US Nuclear Regulatory Commission when he told a nuclear industry conference  
17 that the flawed reactor containment type has as high as a 90 percent chance of  
18 failure if challenged by a severe accident condition. PRB has rejected this for  
19 further review. NRC addressed and resolved the Mark I containment structural  
20 concerns through NUREGs 0476 and 0661.

21 The same reactor design as -- I'm sorry—Item four: The same  
22 reactor design has now dramatically failed Japan to reliably and adequately  
23 mitigate and contain significant and mounting radiological releases to the  
24 atmosphere, groundwater and the ocean, from multiple severe accidents in  
25 multiple GE BWR Mark I units at the Fukushima Dai-Ichi nuclear power plant.

1 PRB has accepted this for further review. This pertains to the events in Japan.

2           Item five: In order to assure long-term containment integrity, an  
3 option to temporarily defeat the containment was provided by NRC to the Mark I  
4 operators by voluntarily installing the hardened wetwell vent system, also known  
5 as direct torus vent system, that runs from the torus directly to the plant vent  
6 stack without going through charcoal bed radiation filtration system. This is in  
7 NRC generic letter 89-16. The petitioners assert that the failure of the Mark I  
8 containment, even with the hardened vent system at Fukushima Dai-Ichi  
9 demonstrates the inadequacy in design to mitigate and contain a severe accident  
10 resulting from longer station blackout. PRB accepted this for further review. This  
11 pertains to the events in Japan.

12           In conclusion the petitioners state, "Given this tragic demonstration  
13 at Fukushima, the rational, reasonable and only relevant protection is to remove  
14 the Mark I from any set of circumstances that might ever challenge the failed  
15 experiment again."

16           With regard to the enforcement actions, the petitioners requested to  
17 immediately suspend operating licenses of all Mark I reactors pending full NRC  
18 review with independent, expert and public participation from affected emergency  
19 planning zone communities. The PRB has rejected this for further review. Any  
20 request for additional action by NRC does not involve any enforcement action  
21 and therefore does not fall under the 2.206 review process.

22           The petitioners also requested that all Mark I reactors' operating  
23 licenses be suspended until the following emergency enforcement actions are  
24 taken. Item one: Conduct public meetings with each of the 10 mile emergency  
25 planning zone for each Mark I reactor site for the purpose of receiving public

1 comment and independent expert testimony regarding the reliability of hardened  
2 vent system or direct torus vent system. The PRB rejected this for further review.  
3 Any request for additional action by NRC does not involve any enforcement  
4 action and therefore does not fall under the 2.206 review process.

5           Item two: Immediately revoke prior pre-approval of the hardened  
6 vent system or direct torus vent system at each Mark I reactor under the  
7 provisions of 10 CFR 50.59. The PRB accepted this for review regarding the  
8 reliability of the direct torus vent system, however, PRB rejected to immediately  
9 revoke the prior approval of the direct torus vent system. This pertains to events  
10 in Japan.

11           Item three: Immediately issue confirmatory action orders to all  
12 Mark I reactors to promptly install safety related backup electrical power, Class  
13 1E, and additional backup DC battery system to ensure reliable supply of power  
14 for the spent fuel pool cooling system. PRB accepted this for further review  
15 regarding backup electrical power. This pertains to events in Japan and the  
16 recent Browns Ferry loss of offsite power. PRB rejected the immediate action.

17           In the first meeting with PRB on June 8, 2011, the co-petitioners  
18 requested that the PRB look into the following concerns: An accidental or  
19 intentional airline crash into the currently unprotected spent fuel pool areas of  
20 these reactors has the potential to sever cooling water pipes, similar to a tsunami  
21 or an earthquake. PRB rejected this for further review. NRC has addressed and  
22 resolved this concern after 9/11 events, through major actions such as mitigating  
23 strategies.

24           Item two: Illinois reactors are operating on river flood plains and  
25 the current situation in Missouri and Nebraska speaks volumes as to what this

1 means in terms of flooding. PRB accepted this for further review. This pertains  
2 to events in Japan and an ongoing NRC investigation.

3 Item three, excuse me, Dr. Kennedy states that critical failure  
4 modes for gross structural failure of the pool is out of plain sheer failure of pool  
5 floor slab. The PRB rejected this for further review. NUREGs 1488 and 1738  
6 sufficiently addressed and resolved this issue.

7 Now let me discuss the NRC activities to date. On April 13, 2011,  
8 the petitioners submitted this petition. On April 21, 2011 the petitioners were  
9 informed that the PRB had denied their request for immediate action. Based on  
10 the information provided in the petition and the information available through the  
11 NRC's ongoing assessment of the Fukushima Dai-Ichi nuclear plant, the PRB did  
12 not identify any immediate safety concerns which would impact the health and  
13 safety of the public. Therefore, the PRB denied the request for immediate action.

14 On June 8, 2011, the PRB held a public meeting with the  
15 petitioners. The PRB's initial recommendations were provided to the petitioners  
16 on August 16, 2011. The petitioners requested this second meeting to address  
17 the PRB.

18 As a reminder for the NRC staff and presenters, please identify  
19 yourself if you make any remarks. This will help us in the preparation of the  
20 meeting's transcript that will be publicly available.

21 Mr. Gunter, I will turn the meeting over to you to allow you to  
22 provide any additional information you believe the PRB should consider as part  
23 of the petition. After your presentation and Mr. Kamp's presentation conclude, I  
24 will allot the remainder of the time to the co petitioners to address the PRB.  
25 Mr. Gunter, you may proceed.

1           PAUL GUNTER: Thank you. We are gathered today as a diverse  
2 panel of nuclear experts, environmental activists, and community leaders before  
3 the Nuclear Regulatory Commission in an appeal for human sensibility, moral  
4 responsibility and due process.

5           Our Appeal comes in the face of a growing nuclear crisis emanating  
6 from the wreckage of the Fukushima Dai-Ichi Nuclear Power Plant in Japan. We  
7 are calling upon this agency to suspend operations at some of the most  
8 dangerous and antiquated nuclear power plants in the world today. We ask the  
9 NRC to provide the American public with its due process to assess the health  
10 and safety implications for millions of people who live in the shadow of 23  
11 General Electric Mark I Boiling Water Reactors. These reactors are virtually  
12 identical in design, construction and modification to those GE Mark I reactors that  
13 exploded, melted down and now cast an irreversible radioactive pall over Japan.

14           I direct my comments to the NRC Petition Review Board's summary  
15 of recommendations as provided on August 16, 2011, to "Accept" in part and  
16 "Reject" in part, portions of the Beyond Nuclear emergency enforcement petition  
17 for further review and consideration. Recommendation 1E: Failure of the Mark I  
18 containment even with the hardened vent system at Fukushima Dai-Ichi  
19 demonstrates the inadequacy in design to mitigate and contain a severe accident  
20 resulting from prolonged station blackout. The Petition Review Board  
21 recommends to accept this concern for further review.

22           The gross failure of the Mark I pressure suppression containment  
23 system is central to our petition requesting suspension and emergency  
24 enforcement action for the operating reactors in our communities around the  
25 United States.

1           To be clear, our concern for Mark I containment failure is not just  
2 contingent upon prolonged station blackout. The central issue is a weak and  
3 unreliable containment itself subject to failure from any number of initiating  
4 severe accident conditions. A reliable containment system is an operating  
5 license condition of every nuclear power station. The containment component is  
6 represented to the American public as the last and final reliable barrier in a  
7 Defense-in-Depth philosophy long touted by this industry. In fact, the General  
8 Design Criteria for the operating license itself requires the containment to be  
9 essentially leak tight.

10           This is the licensing contract that the agency and the nuclear  
11 industry have agreed to. This is the contract that the NRC and the nuclear  
12 industry have made with the American public. However, this claim for the Mark I  
13 reactor is now demonstrated to be patently false. As the petition points out, since  
14 1972, we have known that the Mark I is prone to early containment failure under  
15 severe accident conditions. So much so, that by 1989, an experimental venting  
16 system was approved by NRC and retrofitted by the industry to temporarily  
17 defeat containment, to save it from rupture and a catastrophic release of  
18 radiation. Fukushima, tragically demonstrates that the Mark I containment  
19 reliability is a deceptive falsehood and a breach of contract to both NRC and  
20 public health and safety.

21           The extent of the Mark I gross containment failure is illuminated by  
22 the comments of NRC deputy director Gary Holahan at the July 28, 2011 NRC  
23 task force public meeting. Mr. Holahan states that highly radioactive fuel  
24 fragments found scattered around the Fukushima reactor site as well as more  
25 than one and half miles away from the reactor site are identified to have been

1 ejected from the reactor core. The Mark I gross containment failure is further  
2 confirmed by an October 5 news account of independent evidence presented by  
3 Kobe University of extensive radioactive cesium contamination now documented  
4 at 307,000 Bequerel per kilogram of soil, sampled in locations out to 35 miles  
5 from Fukushima Dai-Ichi.

6 This contamination drastically exceeds Japanese accepted safety  
7 limits and is likely to promote the need for enlarged population evacuations. This  
8 is a distance of more than three times the current 10-mile evacuation planning  
9 zone around United States reactors.

10 Recommendation 3E: Imminently revoke prior pre-approval of the  
11 hardened vent system or direct torus vent system at each GE BWR Mark I unit  
12 under the provisions of 10 CFR 5059. The petition review board recommends  
13 that it "Accept" the requested action for further review.

14 The petitioners request of the agency revoke prior approvals of the  
15 experimental hardened vent system as installed at all U.S. Mark I units and  
16 demonstrated to have failed at Fukushima Dai-Ichi. The petitioners request that  
17 for any subsequent modifications to the Mark I containment that the agency  
18 provide the public with full hearing rights and due process to represent our  
19 interests in public health and safety. The agency must proceed by providing the  
20 public with due process through public hearings on changes in the containment's  
21 license condition as "leak tight" in accordance with the Atomic Energy Act which  
22 upholds under Section 189 that any proceeding under this Act, for the granting,  
23 suspending, revoking, or amending of any license or construction permit, the  
24 Commission shall grant a hearing upon the request of any person whose  
25 interests may be affected by the proceeding and shall admit any such person as

1 a party to such proceeding.

2 Thank you. That concludes my remarks.

3 ROBERT NELSON: Thank you. Mr. Kamp.

4 KEVIN KAMPS: Thank you. My name is Kevin Kamps,  
5 Radioactive Waste Specialist at Beyond Nuclear. And I would like to thank you  
6 for indicating in August that you are giving a positive consideration to our call for  
7 Class E1 power systems to be installed on the high-level radioactive waste  
8 storage pools at Mark Is as well as DC battery systems that would last 72 hours  
9 as well as your indication that you approve that you support the call for  
10 confirmatory action orders to install these systems. But my question is, what  
11 about makeup water that was not mentioned in your chart that you provided to  
12 us? Although the Fukushima task force at NRC has indicated that emergency  
13 makeup water to high level radioactive waste storage pools at Mark Is and all US  
14 reactors makes sense in terms of safety.

15 I also wonder why instrumentation was not mentioned in the chart  
16 that you provided back to us. We did call for additional instrumentation to be  
17 installed on Mark I storage pools. For high level radioactive waste this would  
18 include water level gauges, temperature gauges, and various comprehensive  
19 radiation monitoring systems in order to protect against such risks as inadvertent  
20 criticality in accident situations.

21 We also, in our supplementary filings in June called for hardened  
22 onsite storage as a matter of policy at the Nuclear Regulatory Commission for  
23 safety's sake. This would include emptying of the pools to low-density  
24 configurations as they were originally designed for. And this emptying of the  
25 pools would be into well designed and well constructed dry cask storage, which

1 would be fortified against attack, safeguarded against accident and built to last  
2 for the decades or centuries that NRC is considering onsite storage at atomic  
3 reactors to prevent environmental leakage of radioactivity. This emptying of the  
4 pools could take place for any and all irradiated nuclear fuel that is more than five  
5 years cooled, per design specifications.

6 I just want to emphasize the risks that have been previously  
7 mentioned in our filings with you, just a handful of examples from Mark Is across  
8 the United States. At Oyster Creek, the oldest atomic US reactor, over 700 tons  
9 of high level radioactive waste have been generated. Granted, some of that has  
10 been moved into dry cask storage, but the pool remains full to its capacity. And  
11 this is a re-racked capacity, much greater in terms of quantity of high level  
12 radioactive waste than originally designed for. This represents 125 million curies  
13 of radioactive cesium 137 and NRC has reported at various points in time that up  
14 to 100 percent of this hazardous material could be released from a pool fire.

15 Another example would be Millstone Unit 1 in Connecticut which,  
16 despite having been permanently shut down in 1995, still retains all of the high  
17 level radioactive waste ever generated on that site, apparently an effort by that  
18 company to avoid the cost of dry cask storage. But at what risk, we would ask?

19 Another example is Fermi Unit 2 in Michigan, which happens to be  
20 the largest Mark I in the world, with well over 500 tons of high-level radioactive  
21 waste in its storage pool, representing again nearly 90 million curies of cesium  
22 137. One fact about this pool is that company documents reveal that just over  
23 four hours, four hours and 12 minutes would be required for this large quantity of  
24 high-level radioactive waste to initiate boiling in that pool due to loss of water  
25 circulation.

1           What is the reason that dry cask storage has not been installed yet  
2 at Fermi 2 in Michigan, despite having a permit from the NRC to do so for over  
3 two years at this plant? It turns out that there are hundreds of missing welds on  
4 the top and bottom floors of this facility and the structure is unable to support the  
5 weight of the crane and loaded transfer casks for moving this fuel. So this is  
6 another indication of severe risks with radioactive waste storage at a Mark I in  
7 the United States.

8           Another example is Vermont Yankee, which has well over 635 tons  
9 of generated high level radioactive waste, again some of which has been moved  
10 into dry cask storage but the vast majority is in the pool. This represents around  
11 100 million curies of radioactive cesium 137. In recent years, Vermont Yankee  
12 experienced the near drop of a 100-ton transfer cask onto the refueling area floor  
13 and risking a seismic impact on the pool itself in that way.

14           Another example, Pilgrim in Massachusetts, 550 tons of high-level  
15 radioactive waste, none of which has been moved into dry cask storage,  
16 70 million curies of radioactive cesium 137 and, at least according to the NRC's  
17 website, no plans yet for that company to move any of that waste into dry cask  
18 storage.

19           I would just point out that Fukushima Dai-Ichi Units 1, 2, 3 and 4  
20 combined in terms of the inventory of high-level radioactive waste and their  
21 storage pools, does not match some of these reactors I've mentioned in terms of  
22 how much waste are in these U.S. pools. So the risks are greater here for boil  
23 downs and then the consequences of a radioactive waste fire in these pools.

24           I would like to share with you a press release from Tokyo Electric  
25 Power Company dated October 6, just yesterday, where this is the most recent

1 information the company is willing to share about the status of its pools and it  
2 admits that it was not until August 10 at Unit 1 that cyclic cooling for the water in  
3 the spent fuel pool by an alternative cooling equipment of the fuel pool cooling  
4 and filtering system was operational, nearly five months into this catastrophe.  
5 And each of the other units, Unit 2, it took nearly three months to restore cooling  
6 system. Unit 3, nearly four months. And in terms of Unit 4, it was not until  
7 August 20 that TEPCO started an operation of desalination equipment in the  
8 spent fuel pool and before that, July 31 cyclic cooling at Unit 4, nearly six months  
9 in the catastrophe. And of course, the dramatic images of helicopter water drops  
10 and crowd control water cannons and fire trucks from as far away as Tokyo and  
11 beyond and concrete trucks pumping water in an ad hoc desperate attempt to  
12 keep these pools filled with water as they continue to boil away their water  
13 inventories.

14           And I'll just, in closing, refer you back to the extended extract from  
15 David Lochbaum's book, he's at Union of Concerned Scientists, this was  
16 "Nuclear Waste Disposal Crisis", 1996. His chapter, "Spent Fuel Risks" where a  
17 number of U.S. Mark Is including Hatch, Fermi 2, Dresden 1 -- I'm sorry Dresden  
18 1 but neighboring Dresden 2 and 3 Mark Is and again, Hatch 1 and 2, a series of  
19 incidents involving these pools that show that these risks are very real in the  
20 United States. Thank you very much.

21           ROBERT NELSON: Thank you, Mr. Kamps. Just checking the  
22 time, I want to give the maximum amount of time to each other remaining  
23 co-petitioners. I will suggest about eight minutes for each petitioner --  
24 co-petitioner -- to make their remarks. So I'd like to proceed then with  
25 Mr. Bridenbaugh.

1                   DALE BRIDENBAUGH: Yes, this is Dale Bridenbaugh. Am I  
2 coming through okay?

3                   MALE SPEAKER: A little volume.

4                   ROBERT NELSON: If you could move closer or speak louder, that  
5 would help.

6                   DALE BRIDENBAUGH: I'll try.

7                   ROBERT NELSON: Our court reporter says you're coming through  
8 okay to her, so --

9                   DALE BRIDENBAUGH: Okay, okay. Thank you. Thanks for this  
10 opportunity. As I said, this is Dale Bridenbaugh. I want to reiterate that I am  
11 appearing as an individual. I'm not representing anyone other than myself.

12                   I'm here today to present my opinion on the ongoing operation of  
13 the 23 Mark I containment boiling water reactors in the United States. My  
14 opinion is based on some 40 years of experience in the commercial nuclear  
15 power industry, approximately 20 years as an engineer and manager for General  
16 Electric Company's nuclear business, and another 20 as a private consultant in  
17 nuclear plant studies performed for more than 20 state agencies and several  
18 foreign countries.

19                   The first generation of large boiling water reactors were built by  
20 General Electric in spherical dry containment vessels designed to contain the  
21 energy that could be released in the event of a break in the primary system.  
22 Dresden 1, where I first worked, is a 200-megawatt electric plant and was  
23 housed in a 190 foot diameter sphere which had a volume of nearly  
24 3.6 million cubic feet. This same concept was followed with the next few plants  
25 but as design ratings were increased, dry containment became problematic due

1 to size and cost. With the higher energy content of the larger systems, dry  
2 containments were found not to be economically viable. The Mark I pressure  
3 suppression system concept was developed and the resulting containment size  
4 was reduced by nearly a factor of 10 even for unit ratings some five times  
5 greater. The result was a cheaper containment but at the cost of difficulty in  
6 conducting required maintenance and inspection and with less resistance to  
7 severe accident consequences.

8           In early 1975, the NRC issued letters to all licensed Mark I plant  
9 owners asking for assurance that the Mark I plant did in fact meet required  
10 licensing criteria and that would include that the containments would provide  
11 essentially leak tight response to design basis accidents. This generic request  
12 was in part a result of information shared by GE with the NRC concerning testing  
13 of a Mark III containment concept and was backed up by some early failures at  
14 the first Mark I plants in operation. The 16 Mark I utilities contacted GE for  
15 assistance in answering the NRC request. GE proposed that a safety  
16 re-evaluation program be initiated to determine the nature and extent of the  
17 problem and I was tapped to be the project manager of the program.

18           This program called the Mark I Owners Program began work in the  
19 spring of 1975 and continued well into the 1980s. The intended function of the  
20 program was to develop accepted definitions of the unquantified design basis  
21 accident loads and to develop appropriate modifications.

22           Throughout the program, a great deal of uncertainty was  
23 encountered in quantifying the loads and the containment response to those  
24 loads. The early effort devolved into an exercise in defending continued  
25 operation of the plants through arguments of the low probability of the possible

1 event. The owners group program finally resulted in NRC approved Mark I  
2 hydrodynamic load definitions and subsequent fixes were implemented to  
3 overcome the design deficiencies. The fact remains, however, that the Mark I  
4 plants continued operations for as much as 12 or 13 years outside of the  
5 requirements under which they were originally licensed.

6           The ongoing period of operation under uncertain safety conditions  
7 played a large part in my decision to resign in 1976 from the program and from  
8 GE. The recent experience at the Fukushima Mark I units calls into question  
9 again whether those fixes, assuming they were properly implemented in Japan,  
10 are adequate to meet license requirements so as to safeguard the health and  
11 safety of the public. Even the so-called hardened vent modification in the early  
12 '90s seems to have been inadequate at Fukushima to prevent hydrogen  
13 explosions and containment damage.

14           It will be at least several years, if ever, before the full extent of the  
15 Fukushima accident sequences are known and understood. There are  
16 indications that some of the failures of Fukushima are not limited to the combined  
17 earthquake and tsunami effects, but may have been initiated by the seismic  
18 forces alone. That remains to be seen, but it is unreasonable for all of the U.S.  
19 citizens who could be affected by major accident at U.S. Mark I plants to be held  
20 at risk for yet another period of years when it is uncertain if similar consequences  
21 could happen here.

22           In my opinion it is absolutely essential that commitments be made  
23 that plant specific analyses be performed as soon as possible to consider the  
24 broad range of challenges the Fukushima accident represents to the 23 Mark I  
25 units in the U.S. Further, "Date Certain" limits should be issued for all currently

1 licensed Mark I one units so as to assure that unlimited periods of operation not  
2 be allowed to continue outside appropriate licensing conditions.

3 Thank you very much for your time.

4 ROBERT NELSON: Thank you, sir. I'd like to now ask  
5 Mr. Gundersen to make a statement please.

6 ARNIE GUNDERSEN: Good morning. This is Arnie Gundersen  
7 from Fairewinds. Gundersen has an "E" in it, and Fairewinds has an "E" in it. I'd  
8 like to note that I'm honored to be following Dale Bridenbaugh. He's one of my  
9 personal heroes.

10 I have four concerns about the boiling water reactors with the Mark  
11 I containment. My wife, Maggie and I were walking in late February and she  
12 said, you know, we've found a lot of problems of nuclear plants around the U.S.,  
13 what plant did I think would most likely have an accident? And I responded, I  
14 didn't know which plant would have an accident but I was certain it would be a  
15 General Electric Mark I boiling water reactor. Three weeks after our walk,  
16 Fukushima proved these statements to be correct.

17 My first concern was the Mark I containment was too small when it  
18 was built. I know you're aware by now of the Hanauer memos that were written  
19 in '02 that expressed grave concerns regarding weaknesses in the pressure  
20 suppression containment. Several years later, I was personally involved in  
21 design studies for the BWR Mark III, as the lead engineer on that improved  
22 reactor. As you know, the Mark III study showed that uplift forces on the torus of  
23 early Mark I containments would in fact have destroyed the containment if an  
24 accident had occurred. The world is lucky no accident did occur.

25 In response, the first Band-Aid fix to the Mark I containment were

1 large straps to hold the torus down against these uplift forces. In the 1980s, the  
2 likelihood of a hydrogen gas generation was the installation of vents on the side  
3 of the Mark I containment to prevent the containment from over-pressurization.  
4 These vents were the second Band-Aid fix applied to the design that was  
5 problematic from its inception.

6           Since the purpose of the containment is to contain radiation  
7 releases in the event of an accident, these vents have always seemed absurd to  
8 me because they allow the release of radioactivity and also might not be able to  
9 be closed. At Fukushima, these failed -- these vents failed not once, not twice  
10 but three times. The Mark I was built with significant design and engineering  
11 flaws, two Band-Aid fixes applied in '76 and '89, and yet, the Mark I failed  
12 catastrophically three times in 2011. How then can the NRC ever consider  
13 allowing the Mark Is to continue to operate?

14           My second concern with the Mark I containment design is that the  
15 control [unintelligible] enter through holes in the bottom of the reactor vessel.  
16 This presents a myriad of opportunities for melted core material to leak directly  
17 out of the reactor on to the containment floor. I believe this is exactly what  
18 occurred at Fukushima. The BWR reactor design is prone to melt through and  
19 it's built in a containment that's already inadequate to handle normal reactor  
20 [inaudible]. This was outlined by the Oak Ridge National Laboratory in 1989 in a  
21 report titled "Failure Modes of BWR Reactor Vessel Bottom Vent".

22           My third concern is that the NRC has allowed boiling water reactors  
23 to increase their power in a process called uprate. These uprates are much  
24 larger than similar power increases allowed in pressurized water reactors. As part  
25 of the uprate process many reactors have filed exemption from federal

1 regulations regarding net positive suction heads which is also commonly called  
2 containment over pressure credits. The NRC repeatedly allowed to keep that  
3 overpressure credit for these Mark I designs. And last October, the NRC staff  
4 informed the Advisory Committee on Reactor Safeguards, that they assume  
5 there is zero probability that a containment system will leak. This decision allows  
6 the staff to inform major safety regulation and keep the industry right where it  
7 wants.

8 All three containment systems at Fukushima failed and continue to  
9 leak, thus proving the NRC wrong. The NRC should immediately roll back uprate  
10 reactor that has received the containment over-pressurization credit.

11 And finally, my fourth concern is that three reactor systems were  
12 blown out at the site of Fukushima, thereby exposing fuel in fuel pools directly to  
13 the atmosphere. Brookhaven National Laboratories released a 1997 report  
14 indicating that a fire in a boiled water reactor pool would kill at least 187,000  
15 people. Fear of a fuel pool fire at Fukushima floor was one of the main reasons  
16 the NRC recommended evacuation of U.S. personnel within 100 kilometers of  
17 Fukushima. According to Dr. Gordon Thompson, there's more cesium in the  
18 spent fuel pool at Pilgrim than was ever released by every above-ground nuclear  
19 test ever conducted. The reactor building, with its fuel pool more than 100 feet in  
20 the air is yet another poorly designed aspect of the Mark I design.

21 For these four reasons, I believe there's no basis to allow the Mark I  
22 BWRs to continue to operate. True wisdom means knowing when to modify  
23 something, and knowing when to stop. Sometimes all the king's horses and all  
24 the king's men couldn't try to put Humpty Dumpty together again. Thank you for  
25 this opportunity to speak on the record.

1 ROBERT NELSON: Thank you, Mr. Gundersen. Ms. Katz.

2 DEBORAH KATZ: Yes, thank you for this opportunity to speak. I  
3 want to say that I support all the petitioners who have spoken before me and  
4 their concerns and I also want to say, I really am sort of confounded, gentlemen,  
5 because I feel I've been through this many times with the NRC about the  
6 vulnerability of the Mark I reactors. In fact in the late 1990's this has been raised  
7 and the issues of the fuel pool has been raised before. What puts this all in such  
8 a dramatic backdrop is that in fact what the NRC told us in terms of our reactors  
9 and what could and could not happen, proved to be unconscionably wrong in  
10 terms of what took place at Fukushima. We in fact in 2004 sent a petition into a  
11 number of the groups that are on this phone call right now, as well as the Union  
12 of Concerned Scientists about the vulnerability of the fuel pools to whether it was  
13 an accident or terrorism and the need to move the fuel out of these pools to put it  
14 into dry cask storage.

15 What in fact happened in 2005 is the National Academy of  
16 Sciences came out with the report on the vulnerability of fuel pool storage at  
17 reactors and specifically said that the vulnerability of the Mark I reactors was so  
18 great that the fuel should be moved. They in fact did not want diagrams of their  
19 reactor put into the report because of the seriousness of the vulnerability and the  
20 opportunity for acts of malice to take place. I don't think they even conceived of  
21 what could happen at Fukushima. Each of the reactors at these reactors in  
22 Fukushima failed. We can start with the earthquake and tsunami, but in fact,  
23 what was reported in the paper was that the venting systems failed at each of  
24 these reactors for a different reason, one in which they raised waited too long, it  
25 was reported, another because they could not open the vent and the third

1 because the computer system said the vent was open and it never was. These  
2 are cascading problems that you know has been talked about in terms of black  
3 swan events, as if they could never happen. And the NRC has repeatedly  
4 assured us that this can never happen. You can only imagine what people who  
5 live around Mark I reactors feel about their vulnerability at this moment and feel  
6 about the NRC's unwillingness to deal with this issue in a timely manner. We're  
7 talking about experts who raised problems with these reactors dating back to the  
8 earliest design issues and we are still talking about it and it is 2011 and there is  
9 now a slow motion catastrophe ongoing in Japan with three reactors, like our  
10 own, that will scar that country and the world forever. And I ask you to actually  
11 act in behalf of the people for once in this moment. Lose the fuel out of the fuel  
12 pools and shutter these reactors. Because it is unconscionable that you allow  
13 the nuclear industry to put us at such a risk.

14 Thank you for this opportunity to talk.

15 ROBERT NELSON: Thank you, Ms. Katz. Mr. Zeller.

16 LOUIS ZELLER: Yes, Mr. Chairman. My name is Lou Zellar. I'm  
17 the science director here at Blue Ridge Environmental Defense League where I  
18 have been since 1986. The purpose of our request is to have the Nuclear  
19 Regulatory Commission protect public health and safety through a prompt and  
20 thorough evaluation of safety problems at the Browns Ferry nuclear plant  
21 operated by Tennessee Valley Authority near Athens, Alabama. The petition  
22 focuses on the unreliability of the GE boiling water reactor Mark I containment  
23 system to mitigate a severe accident and the lack of emergency fire systems to  
24 cool high-density storage pools and radioactive reactor fuel assemblies.

25 Petitioners ask that Mark I reactors cease operations until several

1 emergency actions are taken. Further, Blue Ridge Environmental Defense  
2 League seeks the following the specific actions: One, NRC should order TVA to  
3 evaluate pressure suppression containment venting to determine whether the  
4 Browns Ferry nuclear plant should be allowed to continue operation. Two, NRC  
5 should issue an order to TVA to inspect control rod blades at Browns Ferry and  
6 three, the NRC should order TVA to eliminate the existing unsafe irradiated fuel  
7 storage system at Browns Ferry and move the fuel to hardened storage in  
8 concrete structures.

9           In accordance with 10 CFR 2.202, these orders would involve the  
10 modification of a Part 50 license and are back fits. Under 50.109, the  
11 Commission shall always require the backfitting of a facility if it determines that  
12 such regulatory action is necessary to ensure that the facility provides adequate  
13 protection to the health and safety of the public and is in accord with the common  
14 defense and security.

15           These are the facts supporting an enforcement action for Reactor  
16 containment: The GE Mark I reactor was badly designed. To correct a  
17 fundamental flaw; pressure suppression containment systems were added to  
18 these plants in order to prevent high pressure inside the reactor containment  
19 building during an accident. To do this, the direct vent system was designed to  
20 release steam, unfiltered and radioactive, directly to the atmosphere. Banning  
21 such dangerous pressure suppression methods and substituting safer dry  
22 containments was proposed by a few principled nuclear engineers but their  
23 advice fell on deaf ears because it would supposedly make unlicensable the GE  
24 and other plants then under review.

25           It is time to evaluate containment venting to determine whether or

1 not any of these reactors should be allowed to continue operation. The nuclear  
2 disaster at Fukushima Dai-Ichi lends an urgency to the immediate question, what  
3 will it take to convince the NRC to prevent a similar disaster in the United States?  
4 Germany, when faced with the issue of providing energy with adequate  
5 protection to the health and safety of the public, and in accord with the common  
6 defense and security there, said no to the nuclear power program in its entirety.

7 Further, it is just plain wrong to posit, as NRC does, that no  
8 radioactive leaks are associated with the GE Mark I reactor's pressure  
9 suppression containment systems. In order to avoid exceeding the primary  
10 containment pressure limit that is what they are designed to do in an accident.  
11 Tokyo Electric Power Company has finally acknowledged that all three of the  
12 Fukushima Mark I containment systems are leaking significant radiation into the  
13 environment. If, indeed, the United States were unable to license nuclear plants  
14 without pressure suppression containment Band-Aids, then perhaps Germany's  
15 example is correct. The NRC should order TVA to evaluate pressure  
16 suppression containment venting to determine whether the Browns Ferry nuclear  
17 plant should be allowed to continue operation.

18 Control rod cracks: Plant inspections done by the manufacturer  
19 indicate that Browns Ferry Nuclear Plant suffers from cracking of control rods  
20 necessary for shutting down the reactor. Based on this information, the  
21 manufacturer, GE Hitachi, predicts that the control rods will fail sooner.  
22 Information notice issued in June of 2011 states that as a result of the  
23 investigations into the cracking, GE Hitachi has determined that the design life of  
24 certain marathon CRBs may be less than previously stated and is revising the  
25 end-of-life depletion limits of these CRBs. Not only did 100 percent of the control

1 rod blades inspected suffer from cracking, the damage was more widespread  
2 and more serious than previously known. The list of suspect plants with this  
3 problem includes Browns Ferry 1, 2 and 3 and 16 more GE Mark I boiling water  
4 reactors. Based on this evidence, 83 percent of GE Mark I reactors in the United  
5 States are likely operating with cracked control rod blades.

6 Browns Ferry was TVA's first nuclear plant. The initial design  
7 lifespan of nuclear plants is 30 to 40 years. All three Browns Ferry units are  
8 approaching the 40 year mark. NRC renewed operating licenses for these plants  
9 in 2006. The new information regarding control rod cracks came after the  
10 renewal. Control rod mismanagement was involved in at least two major nuclear  
11 accidents at Argonne Low Power Reactor and of course Chernobyl. Although  
12 NRC notice includes no specific enforcement measure, it does point to the NRC's  
13 expectation that plant operators will act to avoid control rod problems caused by  
14 these flaws. Therefore, the NRC should issue an order to TVA to check these  
15 components and not rely on information notice suggestion. Regarding irradiated  
16 fuel pool dangers, TVA stores Browns Ferry's radioactive fuel rods in pools on  
17 upper levels of the plant. Over 1,415 metric tons of irradiated fuel in three pools  
18 is covered by sheet metal building. The area above the spent fuel pool is not  
19 designed to withstand high winds from tornadoes and hurricanes. As stated by  
20 an NRC spokesman, the design of the Browns Ferry spent fuel pool has blowout  
21 panels. In case of a tornado, the panels would blow off. On April 27, 2011,  
22 tornadoes knocked out TVA's electric power transmission lines in Mississippi and  
23 northern Alabama, causing an emergency and automatic cold shutdown of the  
24 Browns Ferry nuclear plant.

25 One NRC inspector told people that these containments were

1 upgraded for assaults such as that on the heels of the September 11, 2001  
2 terrorist attacks. But that is not accurate. The 9/11 changes were only about  
3 airplanes, not multiple problems such as what the tornadoes caused or could  
4 have caused if one had made a direct hit on the plant. Therefore, the NRC  
5 should order TVA to eliminate the existing unsafe irradiated fuel storage system  
6 and move to -- move the fuel to hardened storage in concrete structures.

7           Finally, during the last few years TVA has compiled an unenviable  
8 record of compliance at Browns Ferry. On May 9, NRC issued to TVA a violation  
9 for management failure leading to operational failure of an outboard injection  
10 valve. The malfunctioning valve was not discovered for a year-and-a-half. The  
11 violation was of red significance. The system is necessary for reactor core  
12 cooling during accidents and the valve failure left the system inoperable,  
13 potentially leading to core damage.

14           Earlier on April 19, 2010, NRC issued a notice of violation to  
15 Browns Ferry for failure to meet the requirements for fire protection and safe  
16 shutdown capability.

17           In May of 2004, NRC issued to TVA a notice of violation for  
18 numerous problems and the long term torus integrity programs were cited for  
19 failure to perform numerous weld repairs, omission of welds requiring repair, and  
20 failure to verify the location of repaired welds.

21           These violations support our request that regulatory action by the  
22 NRC is necessary to ensure that operations at Browns Ferry provide adequate  
23 protection to the health and safety of the public and are in accord with the  
24 common defense and security.

25           Thank you for the opportunity to present these remarks. They are

1 accompanied by written remarks which were sent to you this morning.

2 ROBERT NELSON: Thank you, Mr. Zeller. This is. Robert Nelson,  
3 Chair of the Board. We acknowledge the receipt of your letter dated October 7,  
4 2011 to Mr. Lingam, project manager. And we appreciate the oral summary you  
5 provided here.

6 LOUIS ZELLER: You're welcome.

7 ROBERT NELSON: Mr. Kehler.

8 RANDY KEHLER: My name is Randy Kehler. I live in the town of  
9 Colrain, Massachusetts, 10 miles from the Energy Corporation's Vermont Yankee  
10 nuclear reactor which is located just across the state line in Vernon, Vermont and  
11 I very much appreciate the opportunity to speak to the NRC today.

12 I am the Massachusetts coordinator of a tri-state citizens  
13 environmental group called the Safe & Green Campaign that is based in the 50  
14 towns of Vermont, Massachusetts and New Hampshire that lie within 20 miles of  
15 Vermont Yankee. The Safe & Green Campaign was founded four years ago to  
16 assure that Vermont Yankee closes on schedule by March 21 of next year when  
17 its original 40 year license expires and that its power is replaced by safe,  
18 renewable energy sources coupled with increased energy conservation and  
19 efficiency.

20 I too would like to support the petition by Beyond Nuclear and these  
21 co-petitioners and I would like to say first off, that on behalf of the at risk  
22 population of the 20-mile Tri-State maximum danger zone surrounding Vermont  
23 Yankee, that we want to urge the NRC to immediately, as asked by the petition,  
24 to order a temporary suspension of the operating licenses of Vermont Yankee  
25 and the 22 other General Electric Mark I boiling water reactors in this country,

1 pending the completion of a thorough review of the implications for these U.S.  
2 reactors of the failed and still melting down GE Mark I, BWRs in Fukushima,  
3 Japan. With particular attention as earlier co-petitioners have mentioned on this  
4 call, attention to the failed venting systems of the containment vessels of the  
5 Fukushima reactors.

6 I also want to speak to another issue of mitigation that I believe has  
7 not yet been spoken to. Central to the NRC's mission, as I understand it, is the  
8 creation of a climate of public confidence and the role the NRC to protect the  
9 public from any harmful effects of the operation of nuclear reactors and  
10 especially from the potential of catastrophic accident that could results from a  
11 variety of adverse and unexpected circumstances. In the community surrounding  
12 Vermont Yankee, the public's confidence in the NRC's ability or perhaps  
13 willingness to exercise this crucial role on our behalf was already very low prior to  
14 the Fukushima disaster. When less than two weeks after that still continuing  
15 disaster erupted in March of this year, the NRC, without waiting to see what the  
16 safety implications for U.S. Mark Is like Vermont Yankee might be, officially  
17 approved the Entergy Corporation's application for a 20 year license renewal.  
18 Residents of this area were shocked and any confidence people still had in the  
19 NRC to protect us from radiological danger virtually disappeared.

20 For this reason, I want to further urge the NRC together with the  
21 appropriate officials of FEMA to hold public accountability hearings in each of the  
22 23 Mark I reactor communities, including that which surrounds Vermont Yankee,  
23 for the purpose of explaining to the people of these areas why their reactors have  
24 not been temporarily shut down, if they have not, and if they have, what the NRC  
25 is going to do to make sure that these reactors, so similar to those in Fukushima,

1 are not also vulnerable to a catastrophic accident.

2           Finally, and I believe this is at least indirectly related to the content  
3 of the Beyond Nuclear petition, I want to say that in this current period of  
4 increasingly extreme climate conditions involving larger and/or longer  
5 earthquakes, droughts, storms, flooding, etc, the danger posed by the Vermont  
6 Yankee reactor was brought home ever more clearly due to the recent Hurricane  
7 Irene. As you are no doubt aware, heavy rainfall and overflowing rivers caused  
8 massive flooding on a scale that had not been seen in nearly 100 years, resulting  
9 in enormous damage to buildings, roads, bridges and farms in scores of towns in  
10 parts of Vermont, New Hampshire, western Massachusetts and eastern New  
11 York state, including the town of Vernon, Vermont where Vermont Yankee is  
12 situated on the banks of the Connecticut River. Cordially, the Connecticut did not  
13 overflow its banks in Vernon. However, the intense rainfall accompanying the  
14 hurricane thoroughly saturated the ground around Vermont Yankee, which has to  
15 have aggravated the existing problem of the reactors' underground electrical  
16 cables which, as you know, were never designed to withstand wet, much less  
17 underwater conditions.

18           Because as we know the immediate cause of the Fukushima  
19 disaster was not the earthquake or the tsunami themselves that occurred off the  
20 northeast coast of Japan but loss of electrical power to the reactors. We are well  
21 aware of the various ways the loss of power could occur at Vermont Yankee  
22 including as a result of the malfunctioning of the safety related underground  
23 electrical local cables. I assume that the NRC is also aware of this problem due  
24 to all kinds of expert testimony on this issue. Yet, to my knowledge, no remedial  
25 action regarding underground cables or even a complete systematic inspection of

1 every inch of such cables has been undertaken or is even being contemplated.  
2 This is unacceptable to those of us who live in the shadow of this reactor and  
3 those like it.

4 Thank you very much for hearing my testimony today and I hope  
5 you'll take very seriously the concerns all of us have expressed.

6 ROBERT NELSON: Thank you Mr. Kehler. Mr. Mariotte.

7 MICHAEL MARIOTTE: Thank you. I am Michael Mariotte,  
8 Executive Director of Nuclear Information and Research Service. We are the  
9 information and networking center for people concerned about nuclear power.  
10 We work with hundreds of organizations and tens of thousands of people across  
11 the United States and tens of thousands more across the world. Thank you for  
12 holding this meeting.

13 You've heard from the petition sponsors and we support them.  
14 You've heard from the engineers and we support them. You've heard from  
15 citizens who have been working on reactors that impact their communities and  
16 we support them. I guess it's my job to try to bring the perspective of the public  
17 on this issue, a perspective that has certainly broadened and deepened since  
18 March 11.

19 Quite frankly, the public doesn't understand you. They really don't  
20 understand why a petition like this is even an issue of discussion. You know, I  
21 saw -- I saw a poll recently that indicated 95 percent of the people in the world  
22 know about Fukushima, 95 percent. It takes a really extraordinary event for 95  
23 percent of the people in the world to know about it, yet they know about  
24 Fukushima. They saw Mark I reactors explode there and release toxic radiation  
25 across the world. And they know that's not a good thing and that something has

1 to be done to insure that never happens again. But most of those 95 percent  
2 don't know yet is that as been referred to in the petition, has been referred to by  
3 others here today, is that you, this agency, meaning this agency, knew 40 years  
4 ago that this is exactly what would happen if a Mark I reactor were challenged.  
5 Your predecessor agency, the Atomic Energy Commission was told by your own  
6 safety officials that the Mark I reactors were deficient and shouldn't be allowed  
7 operate. And that plea was denied by the top official at the AEC, not because  
8 the Mark Is were safe, but because banning them, "Could well be the end of  
9 nuclear power."

10           And so the USAEC and as it's morphed into the NRC, you began a  
11 policy of relying on luck as the fundamental protection for the public from the  
12 Mark Is, a hope that nothing would happen that would challenge them. In 1986,  
13 as has been referred to, you were reminded again by your top safety official  
14 about what would happen if a Mark I were challenged. It would explode with a 90  
15 percent probability of containment failure.

16           Rather than close the reactors at that time to protect the public from  
17 new deficient design, this agency chose the Band-Aid approach and so we saw  
18 the installation of containment venting systems with the theory being well, since  
19 these reactors will explode and cause a catastrophe if they're challenged, if we  
20 vent them first and release some of the hydrogen gas and some of the radiation,  
21 maybe they won't explode and release all of their radiation. In other words,  
22 rather than try to address the fundamental design deficiencies of these reactors,  
23 the NRC decided to try to compensate for them. It was like putting a Band-Aid  
24 on a broken leg. It didn't help much, but at least it was doing something, but the  
25 primary defense was still dumb luck.

1           Of course as we saw at Fukushima, the luck ran out. The  
2 containment venting system didn't work. It turns out it needed power and there  
3 wasn't any. And so these GE Mark I reactors did exactly what was predicted 40  
4 years earlier, they exploded, their containments failed and enormous amounts of  
5 radiation were released. But instead of learning a lesson and now closing these  
6 deficient reactors, the NRC staff through the Fukushima task force is now  
7 proposing to make the venting systems a little better. That's something. But it's  
8 compensating for the failure of the compensation you've already made for the  
9 design deficiencies. The Band-Aid you put on 25 years ago is fraying, so you're  
10 proposing to put another Band-Aid on over it and crossing your fingers for  
11 continued luck in the U.S., the luck that ran out in Japan.

12           What we don't understand and what the public doesn't understand  
13 is why you don't just close them. The Mark I reactors account for less than  
14 4 percent of the U.S. electricity supply. There is plenty of reserve power on hand  
15 to cover that. If they all closed tomorrow, in terms of electricity availability, no  
16 one would ever notice.

17           That would seem to be the prudent thing to do if the goal was to  
18 protect the public health and safety. Relying on Band-Aids and luck certainly has  
19 proven insufficient but the Mark Is of course are mostly older and paid for and for  
20 the utilities that own them, well, they surely generate a lot more than 4 percent of  
21 their profits. And that's a powerful incentive for those utilities to keep them  
22 running, regardless of the risk to the public. And after all in the U.S., our luck has  
23 held out for 40 years now.

24           You know, we're tired of that kind of thinking. Actually, we're fed up  
25 with that kind of thinking. It's too familiar. Large corporations with facilitation

1 from government agencies putting profits above our economic interests above  
2 our environmental interests, above our health and safety. You know, that's the  
3 same reason ever-growing numbers of people are occupying Wall Street and  
4 why that movement is spreading to city after city. We're fed up with the concept  
5 that the interests of these large corporations, in this case large nuclear utilities  
6 and reactor manufacturers constantly are placed above those of the American  
7 people.

8           This isn't a normal matter of regulatory dispute between the NRC  
9 and some public interest groups. We all know that happens frequently. We all  
10 work together. We all know our roles in trying to resolve those kinds of disputes.  
11 This issue goes far beyond that. This is a matter of life and death. This is about  
12 our very lives and those of our children and grandchildren. This is about the very  
13 existence of our homes and communities. There are at least 80,000 people in  
14 Japan who have already have lost their homes and their communities and their  
15 livelihoods. We are already seeing health effects and we will be seeing more in  
16 the years to come, especially among the children. And we don't want to see that  
17 happen here.

18           No one knows what the next challenge to one of these reactors will  
19 be. It probably won't be an earthquake/tsunami. It might be a hurricane. It might  
20 be a large solar flare, operator error, broken type, broken pipe, something we  
21 don't foresee at all. But we do know as you've known for 40 years and we have  
22 known for 40 years, what will happen when that challenge comes. The reactor  
23 will fail and more communities will be lost and more lives destroyed. And that will  
24 be on your hands because you have the power to change that. You have the  
25 power to close down those reactors and stop with the Band-Aids and stop relying

1 on pure dumb luck as a protective measure.

2 If you prefer, maybe we can expand the occupy movement from  
3 Wall Street and Washington to Oyster Creek and Dresden and Vermont Yankee  
4 and the rest and just go in there and turn these things off ourselves. To be  
5 honest, we would rather that our government do the right thing and act on behalf  
6 of the public for a change. So I urge you to not only adopt this petition, the parts  
7 that you are considering now, but to go back and reverse your earlier decision to  
8 deny parts of this petition and instead adopt it in its entirety. Thank you.

9 ROBERT NELSON: Thank you, sir. Ms. Paul.

10 BOBBIE PAUL: My name is Bobbie Paul and I want to thank  
11 Mr. Mariotte. I really feel he should have been the closer and because I'm very  
12 moved and in my Quaker tradition I feel like letting those words hang in there for  
13 just a second. But, being a good southerner now, I will move on and I'm going to  
14 speak as Executive Director of Women's Actions New Direction. We're 27 years  
15 old in the state of Georgia and we were founded as Women's Action for Nuclear  
16 Disarmament. We regularly communicate with over 3,500 people weekly through  
17 social media and our e-mails, list serves.

18 As you know, down here in Georgia we have four nuclear reactors  
19 and I'd like to speak directly to the ones in plant Hatch near Baxley, Georgia.  
20 And I'd like to especially support the public meetings and about the 10-mile  
21 emergency planning zones.

22 The two reactors at Baxley near -- on Plant Hatch are identical, as I  
23 understand it, to the ones at Fukushima. These reactors came on line in '75 and  
24 '79 and in 2002 they were given a 20 year license extension.

25 The effected reactor communities, specifically within the 10-mile

1 emergency planning zone, deserve to have meetings and to be heard. In light of  
2 the ongoing tragedy of Fukushima, why shouldn't we have these meetings? And  
3 why should we have faith in these GE Mark Is? There's simply too much at  
4 stake.

5           One week ago, the Associated Press reported that radioactive  
6 water containing tritium was leaking from under one of the buildings at Plant  
7 Hatch. Officials discovered tritium in two test wells about 25 feet below ground.  
8 Southern Company—are you all able to hear me?

9           ROBERT NELSON: Yes ma'am.

10          BOBBIE PAUL: I'm getting some feedback on my phone, I'm sorry.

11          ROBERT NELSON: You're coming through loud and clear here.

12          BOBBIE PAUL: Thank you. The leak was large enough to raise  
13 the water table in the wells at least 5 feet. Southern Company's vice president  
14 Dennis Madison said we really don't know what the rate is but it is certainly more  
15 than a drip. The levels of tritium shot the concentration in the drinking water up  
16 to 200 times the limit set by EPA. As we know, tritium can be quite ubiquitous in  
17 the environment and once it's released into the environment it's almost  
18 impossible to recapture. At Georgia we care a lot about tritium as a mutogenic,  
19 carcinogenic, and multi generational radio nucleid. The executive director of the  
20 Altamaha River keeper, Deborah Shepherd, called me this morning and wanted  
21 to me to express this: She has lived around the Plant Hatch region for decades  
22 and I quote her, "The Altamaha River is a regionally significant resource as it  
23 provides the water to support all the estuaries that produce much of Georgia's  
24 seafood. Any impact of toxicity or contamination to the Altamaha River has  
25 serious and ecological and economic significance for the region. Please, our

1 people need and want to know what is going on.

2           Interestingly enough, these leaks have been reported and were  
3 supposedly fixed in 2006. And there have been reported leaks into the late '70s  
4 and early '80s.

5           As one who represents grass-roots community, I plead with the  
6 NRC to come to the Hatch community, specifically near Baxley, Georgia. Given  
7 this latest catastrophe we are turning to you, the NRC, and we hold you and  
8 Southern Company, our utility, accountable for the operation of these reactors.  
9 Please take testimony from the public. Listen to their concerns. These Mark I  
10 BWRs -- these have blown up and melted down; how can the NRC in all good  
11 faith explain the continued operation of these reactor types? Communities such  
12 as those located around Hatch deserve an honest discussion about the issues.  
13 We need a transparent process and to know what is literally at stake.

14           Mr. Zeller said earlier that Germany turned away from nuclear  
15 power. In a May article or June article of Business Weekly, it was quoted that  
16 Angela Merkel felt that one nuclear disaster to her country would cost her country  
17 11 trillion U.S. dollars. There certainly is so much of stake and the seismic  
18 issues need to be studied down here because as we know around Augusta,  
19 Plant Vogtle, Charleston, we have a great deal of seismic activity.

20           We're sick and tired of hearing from companies, from our utilities  
21 that claim that there are no threats to public health with these leaks and with  
22 these continued accidents. The unthinkable happened at Fukushima—

23           FEMALE SPEAKER: Bobbie's talking to the NRC at a hearing.

24           Oops.

25           BOBBIE PAUL: — and the unthinkable we need to know could

1 happen here. Thank you very much for the opportunity to bring up a voice from  
2 Georgia.

3 ROBERT NELSON: Thank you, Ms. Paul. I believe that concludes  
4 the remarks from the petitioners and co-petitioners. Ms. Paul, I think you're  
5 phone is still open.

6 BOBBIE PAUL: Someone is commenting but they're not here  
7 because I'm alone. Let me -- I'll mute my phone.

8 ROBERT NELSON: At this time, does the staff from NRC  
9 headquarters have any questions for the petitioners and co-petitioners that  
10 address the Petition Review Board? Seeing none, are there any questions from  
11 the region? Region 1?

12 CHRIS CHRISTENSEN: Region 2 has no questions.

13 DAVE HILLS: Region 3 has no questions.

14 TOM FARNHOLTZ: No questions from Region 4.

15 ROBERT NELSON: Thank you. Do any licensee representatives  
16 in the room or on the phone have any questions or comments for the petitioners  
17 or co-petitioners? Hearing none --

18 BOBBIE PAUL: This is Bobbie Paul. I would like to know the name  
19 of the person from Region 2 because I don't think that person identified  
20 themselves when you made introductions.

21 CHRIS CHRISTENSEN: Yes this is Chris Christensen, the deputy  
22 director of the Division of Reactor Safety in Region 2.

23 BOBBIE PAUL: Thank you.

24 ROBERT NELSON: Thank you. Mr. Gunter, Mr. Kamps, Mr.  
25 Bridenbaugh, Mr. Gundersen, Ms. Katz, Mr. Zeller, Mr. Kehler, Mr. Mariotte and

1 Ms. Paul, thank you for taking the time to provide the NRC staff with clarifying  
2 information on the petition that you have submitted.

3 Before we close, does the court reporter need any additional  
4 information for the meeting transcript? Thank you.

5 KEVIN KAMPS: Excuse me, Chairman, I didn't realize that was last  
6 chance to speak before. I have one point. I ran out of time during my  
7 presentation.

8 ROBERT NELSON: Please go ahead, Mr. Kamps.

9 KEVIN KAMPS: The point I wanted to make is that when I spoke  
10 about class E1, AC and DC power backups on the high-level radioactive waste  
11 storage pools, I think it's important for us to emphasize that what we're getting at  
12 is the prevention of boiling in the first place in the pools. The NRC's Fukushima  
13 task force has called for makeup water on the pools but that presupposes that  
14 boiling is already under way. And the reason for our concern that boiling must be  
15 prevented in the first place is that there are unforeseen and unpredictable  
16 consequences of steam releases, high levels of humidity and condensation  
17 within these reactor secondary containment buildings, especially for the electrical  
18 system structures and components, many of which are safety related. And so I  
19 wanted to emphasize the importance of boiling in the first place and that would  
20 be accomplished through providing these emergency backup power systems to  
21 continue circulating cooling water in the pools.

22 ROBERT NELSON: Mr. Kamps, thank you for your additional  
23 clarifying comments. Given that, those comments -- are there any questions  
24 regarding those final comments by Mr. Kamps from any of the staff either here or  
25 on the phone?

1                   MALE SPEAKER: Yes, Mr. Nelson. This is the headquarters  
2 operations officer. Do you desire to unmute the lines going to the Verizon  
3 external bridges servers? There are about 30 participants out there.

4                   ROBERT NELSON: No, I do not.

5                   MALE SPEAKER: Thank you.

6                   ROBERT NELSON: One last check with the court reporter. Do  
7 you need any additional information?

8                   Okay. With that, this meeting is concluded and we will be  
9 terminating the telephone connection. Thank you very much.

10                  [Whereupon, the proceedings were concluded]